may 1958

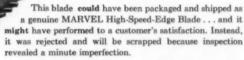
DUE DOOK

Advanced tracer techniques for CONTOUR MACHINING

a hitchcock publication

Short Run General
Purpose Press Tools—Page 114
Looking Ahead with
Chemical Milling —Page 127





There's nothing unusual about this. Certainly, other hack saw blade manufacturers inspect their products, and undoubtedly reject blades for one reason or other, because they are trying to market the best blades they know how to make.

And that's the point—here at MARVEL, where the composite blade was invented and perfected over 30 years ago, we believe we know more about making high-speed-edge hack saw blades than any other maker. We've been at it longer, and the unequalled performance of MARVEL Blades on every kind of material is evidence that we're right.

Use MARVEL Blades on your power hack saws with perfect confidence that they have no equal. You can get MARVEL Blades at your nearby Industrial Distributor.



Write for the new MARVEL Cutting Tool Bulletin.

ARMSTRONG-BLUM MFG. CO.



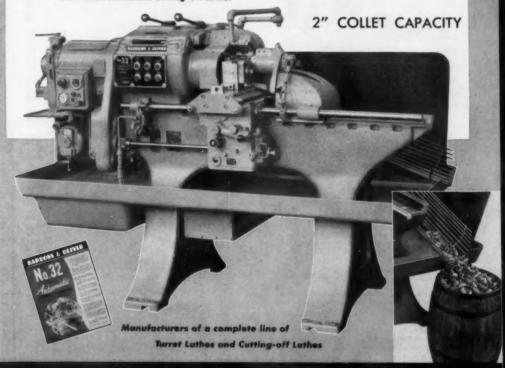
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CUT-OFF and CHAMFERED BOTH ENDS . . . ON THE

BARDONS & OLIVER No. 32 Automatic CUTTING-OFF Lathe
This outstanding machine offers high speed production for both roller cutting-off
and chamfering on tubular work . . . and blade cutting-off and chamfering for
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This single spindle machine represents a substantially lower investment than a multiple spindle machine, yet will produce as many or even more pleces per hour. Some light forming and grooving operations can be performed while cutting-off. Complete setup change from one diameter and length of work to another is only a matter of minutes. A wide range of quick change speeds and feeds is available for consistent high production.

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POWER UNITS

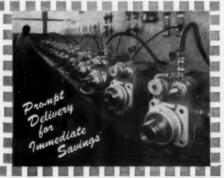


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geared type, for extreme accuracy and heavy
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Way Type Hydraulic Feed
Units up to 30 k.p. with "Balanced
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spindle work.



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MACHINE and TOOL BLUE BOOK



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Step Chuck Work — For rapid and accurate holding of tubing, castings, moldings, stampings and machined parts. Capacity to 6".



Jaw Chuck Work—Integral mount, universal or independent, for extra occuracy. Capacity to 5".



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SPECIFICATIONS: 1%" Collet Capacity 9" Swing 17" Center Distance Infinitely Variable Speed 230—3500 r.p.m.

The above three important requirements for proper lathe work in tool rooms, production departments, or laboratories are completely fulfilled by the new Hardinge DV59 High Speed Precision Lathe.

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Rapid Indexing-always easily accessible from top or bottom sides . . . reduces down time.

Replaceable Seat of Hardened Tool Steel-prevents damage to shank.

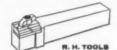
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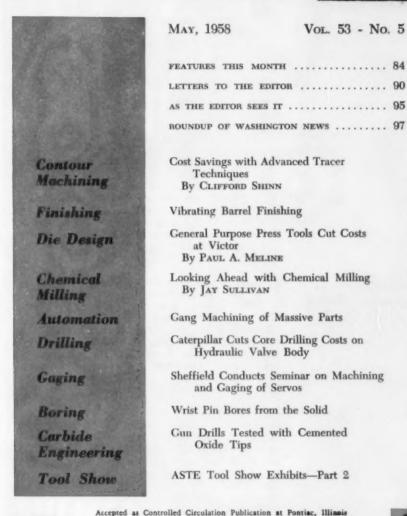


Tool Posts.

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MACHINE and TOOL BLUE BOOK

Reader's Guide







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| Reader's Guide | |
|--------------------------|--|
| | continued |
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WEIGH
THE
DIFFERENCE
IN TIME
AND
MONEY

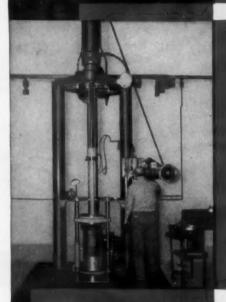
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ARBOR-LOC is a big timesaver in interchanging the seven cutting tools on the table of the CINCINNATI Dial Type Milling Machine illustrated here.

CINCINNATI°

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Reduces Setup Time Standard Cincinnati Arbors interchanged in seconds!





ARBOR-LOC is a new cost-reducing feature incorporated in *most CINCINNATI knee-and-column milling machines. It gives the operator an opportunity to quickly and safely change cutters and arbors as often as required. Just picture these ARBOR-LOC advantages for your own shop:

Increases productivity of the machine for short runs.

No need for special-purpose quick-change accessories for multiple operations. ARBOR-LOC accommodates Cincinnati's complete new line of standard No. 50 flanged arbors and adapters.

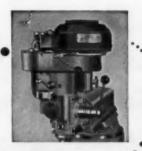
Simplifies tooling problems through more complete standardization of arbors and similar accessories.

Quickly assembled and removed for setups where not required. Does not restrict use of existing arbors, adapters, etc.

*The following CINCINNATI knee-and-column milling machines are equipped with ARBOR-LOC spindle nose: Nos. 2ML; 2 and 3MI; 2, 3 and 4 Dial Type; 2 and 3 High Power Dial Type; 2 and 3 Dual Power Dial Type; plain, universal and vertical styles. You may obtain more information by writing for publication No. M-2016.

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CUTTING FLUIDS • GRINDING WHEELS

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CINCINNATI 9, OHIO



variable speeds 60 to 3300 r.p.m.

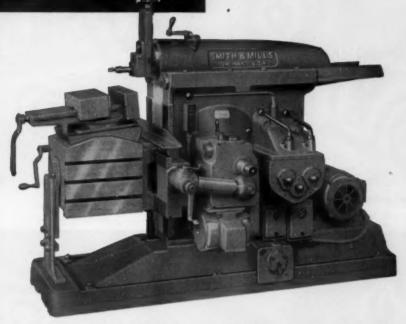
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Spindle speeds infinitely variable from 60 to 3300 r.p.m. make the 2UVR Vertical Mill useful for a wide range of work not heretofore accomplished by mills of this size. Exclusive features include:

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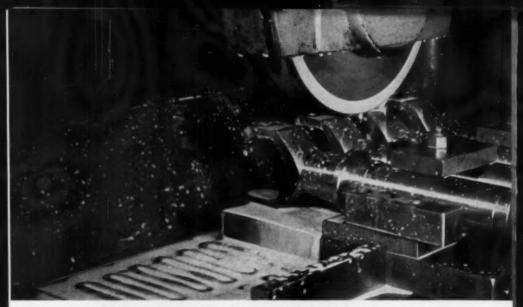
SHAPERS Smith & Mills



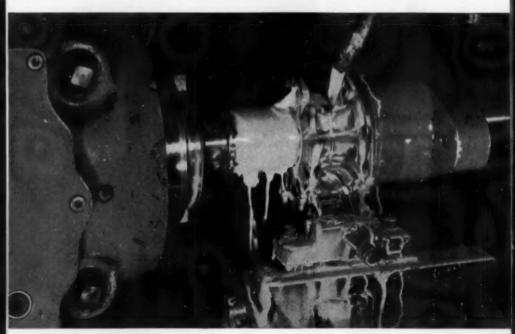
Compare Smith & Mills with any other shaper for versatility, speed, cutting power and precision performance. Compare and you'll buy Smith & Mills-famous for high quality shapers since 1888. Write or wire for prices, deliveries, repair parts or field service. Smith & Mills Shaper Division, Nebel Machine Tool Corp., 3491-B Central Parkway, Cincinnati 25, Ohio.

> Smith & Mills Shapers now available in Heavy Duty Models in 16", 20", 25", 28", 32" and 36" strokes, and Standard Duty Models in 20" and 24" strokes.





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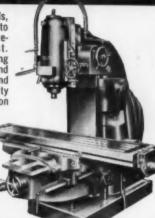
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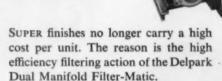
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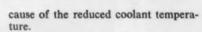
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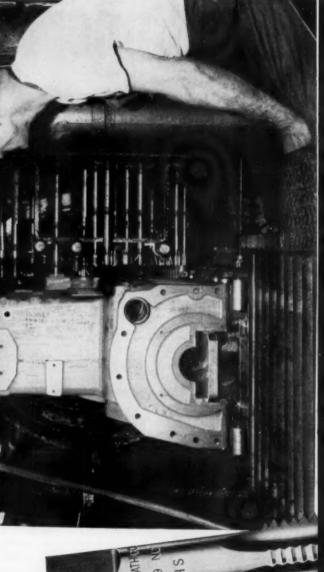
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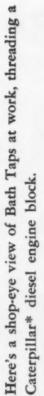
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inch in recommended. my from 3/8" to 5/8" to be cut. Recommendations for fabricating Formica Fig. 2 curately located under drill to probushing and becoming dull. WORK 2 00 3 TIMES PITCH Fig. 3 dias-base naterial use Morse quick twist idell. For tapping procedure has been seed for all types of materials. A ground high-t Morse electrolised tap is recommended.



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Top performance on the job, hole after hole after hole . . . that's why the instruction manual of the Formica Corporation specifies:

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Procedure has been standardized for all types of materials. A ground High-Speed Steel MORSE Electrolized Tap is recommended."

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> MORSE means "THE MOST" in Cutting Tools

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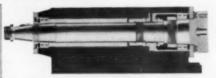
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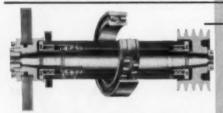
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"SPIRO"
DRILL CHUCK

For heavy duty precision drilling on drill presses, jig borers, vertical mills, etc., Spiro chucks represent quality at its best.

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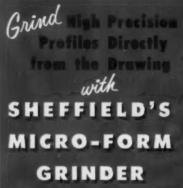
Non-slip grip — Spiro chucks have tremendous gripping power that automatically tightens as Poad increases—drills will not slip.

Spiro saves time —when frequent tool changes are required, quick hand tightening and release greatly reduce down-time.

Spiro chucks are available in five capacities from 5/32" to 5/8"—right hand drive only—for all standard taper shank arbors.

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- No templates needed
- Perfect toolroom accuracy
- Saves up to 75% on profile work
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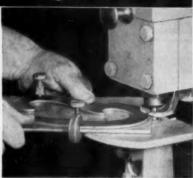
For fast, economical cutting of flat metal shapes there are OF Campbell Nibbling Machines

... with cutting capacities ranging from 3/32'' mild steel for MODEL 0 machine to 1/2'' mild steel for MODEL 530, in sheet sizes from 16'' or less, to 72''.

CAMPBELL NIBBLERS are making tremendous savings in time and money for hundreds of users in aircraft and other metal-working plants.

...in fast cutting of ferrous and nonferrous sheet metals or composition sheets.

...for moderate production runs or experimental development work.





Economical "throw-away" punch and die



Send for this catalog for complete information on this versatile production and experimental tool

• CAMPBELL NIBBLERS cut from 40 to 60 times faster than drilling or filing. A fast-moving punch (350 to 900 strokes per minute) operating over a die, nibbles out the design, taking a small "bite" with each stroke of the punch.

- ... for any and all kinds of shapes
- ... for either inside or outside cuts
- ... with no distortion of material—no internal strains—no invisible fractures—no burr
- ... with a "nibbled" edge that is sufficiently smooth to require very little finishing and sometimes none

CAMPBELL standard punches are made double end to double work life and halve the cost. Prices are so low (starting at 40c each, or 20c per working end) that new punches cost less than regrinding dull ones.

Here is a quick picture of CAMPBELL NIBBLING MACHINE Capacities

| ampbell Nibbier Model# | Sheet | WORKING CAPACITY Sheet Thickness Mild Steel Alloy Steel | Strokes per Minute |
|------------------------------|-------|---|--------------------------|
| 0 | 16" | 3/32"1/16" | 900 |
| | | 3/16"1/8" | |
| 430 | 60" | 3/8"1/4" | .350-525 |
| 436 | 72" | 3/8"1/4" | .350-525 |
| 530 | 60" | 1/2"5/16" | .350-525 |
| 2524 | 48" | 1/4"3/16" | .375-650 |
| 2536 | 72" | 1/4"3/16" | .375-650 |

CAMPBELL NIBBLERS

Wilson Mechanical Instrument Division
AMERICAN CHAIN & CABLE

937 Connecticut Avenue, Bridgeport 2, Connecticut





Heavy Duty Vertical Milling Attachment

Heavy duty attachments increase versatility of dependable, low-cost

GREAVES MILLS

"THE MOST MILL FOR THE LEAST MONEY"

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Universal Milling Attachment



Toolmakers Overarm

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May, 1958



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(FOR ROTATING OR STATIONARY-SPINDLE MACHINES)

for smooth, clean thread form . . . fine fit . . . uninterrupted tapping . . . on long or short runs

POSITIVE PRECISION—Compact construction and unique core piece design assures rigid, full-length chaser support; heavy body supplies ample side support.

NO TIME LOST—Positive, trigger-like collapsing action at instant cut is finished eliminates drag... provides fast, unmarred threading on all types of horizontal or vertical machines, at maximum machining speeds.

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precision-ground throughout, assures less wear—greater accuracy. Less down time because replacements are fewer and easier.

QUICK ACCURATE ADJUSTMENT for all diameters within range of head. One screw adjusts all chasers, simultaneously, to precise diametric requirement.

VERSATILE—Same RST Head can be used on either stationary or revolving-spindle machines.

A WIDE RANGE OF SIZES AND TYPES



Solid, adjustable.
Range 1 1/4" to 4".



With radial blade chasers. Range 1 1/4" to 4".



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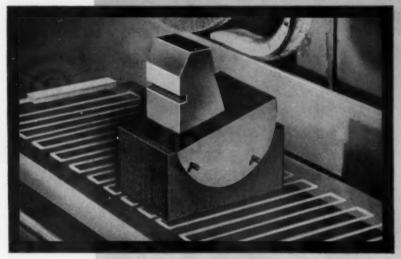
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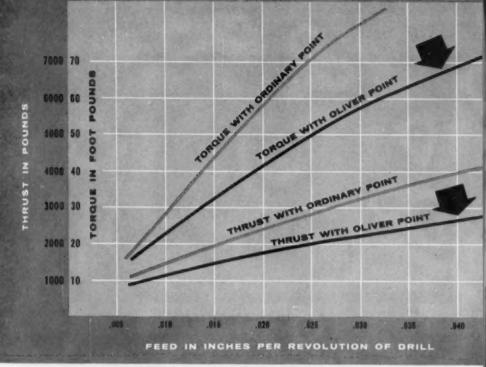
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The drill point on the right is one as ordinarily ground. On the left is an exaggerated view of an Oliver drill point. Note that the clearance angle on the point increases very rapidly as the drill web is approached.

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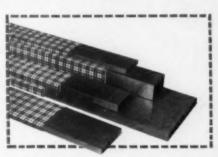


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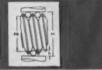
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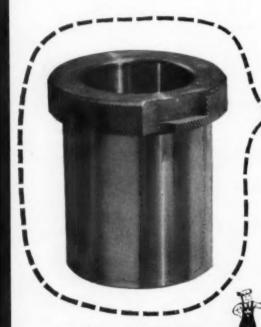
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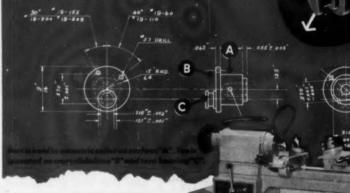


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Motor runs continuously regardless of number of times spindle is started and stopped.



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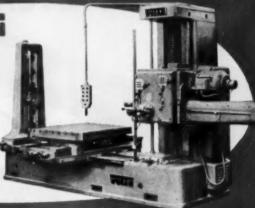
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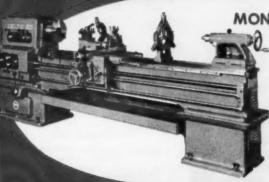
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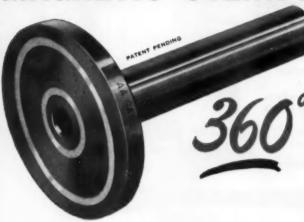
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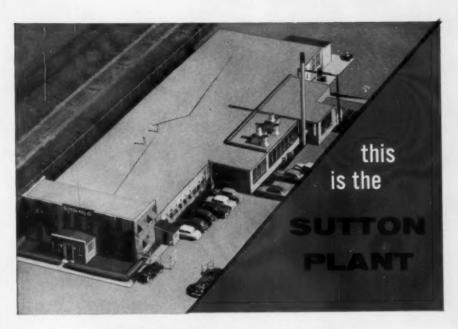
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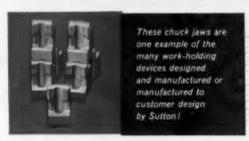




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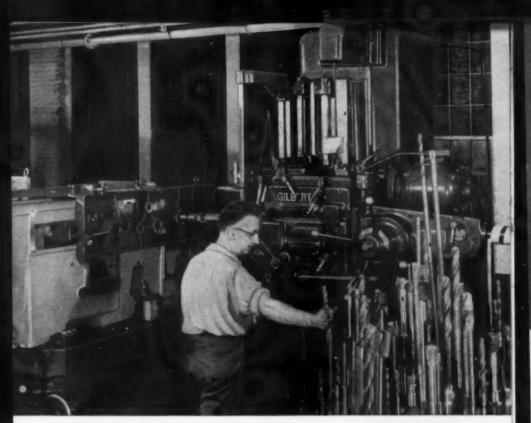
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May, 1958

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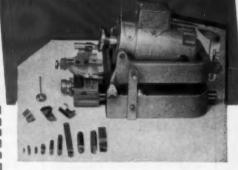
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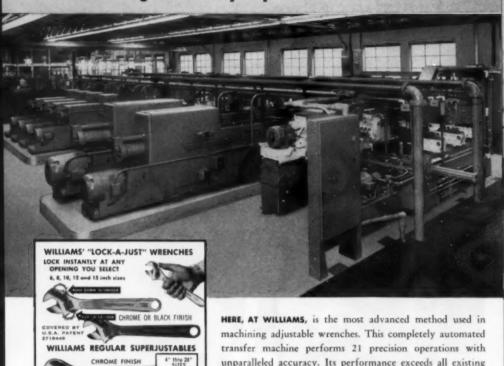
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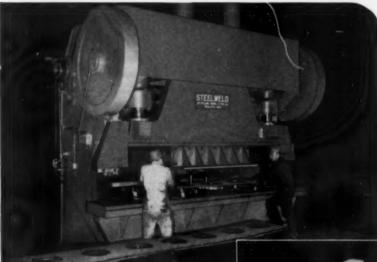
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Also Performs Bending and Flanging Operations

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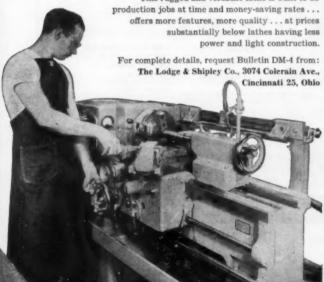
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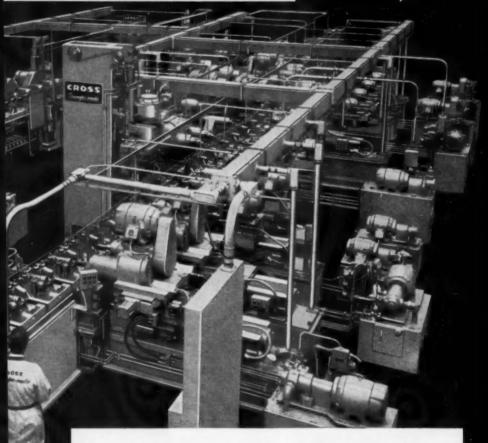


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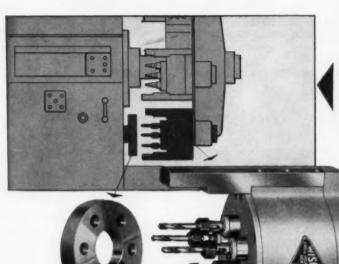


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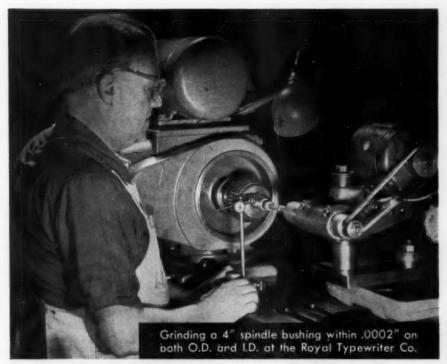
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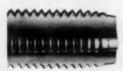
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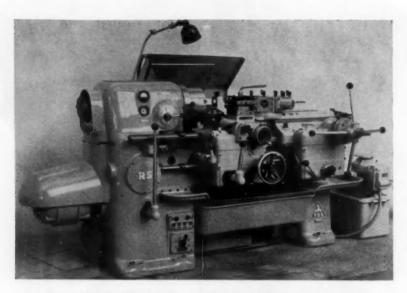
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The new Jones & Lamson Precision Boring Machine may very well be just what your production operation needs. This new machine performs turning, boring and facing operations accurately, speedily and economically. Here it is shown on the job at Olson Mfg. Co., Worcester, Mass., turning, facing and boring electronic parts, in lots of 4000 to 6000 pieces. Two O.D.'s are held to .0005", and two bores to .0002". Concentricity between the bores, I.D.'s, and faces, is held to a total of .0008", at high production rates.

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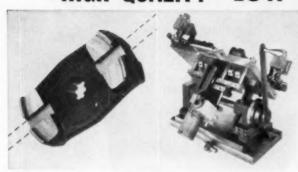
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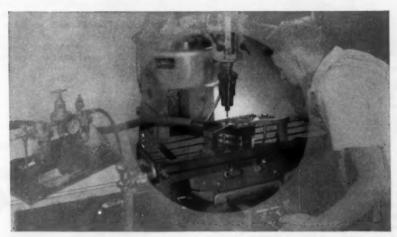
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- Elevating handwheel at waist height.
- Timing belt table drive.
- · Hardened and ground lead screws.
- 12" wheel direct driven by 2 H.P. motor.
- · Precision ball-bearing spindle.

No. 7A 6"x 12"x 1114"

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Ideal for grinding tools, dies, chip breakers, thread chasers. Grinds work 6" x 12" x 111/4" high under 7" wheel. Use any 5" x 10" or 6' x 12" mag. chuck.

- Elevating handwheel waist high.
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- Timing belt table drive.

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- Sealed-for-life b.b. spindle.
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Low cost with precision and rugged construction. Easy to operate. For precision gage and form tool work as well as surface grinding. Grinds work 6" x 18" x 15" high under 7" wheel, Long, table travel 20"; transverse 7'

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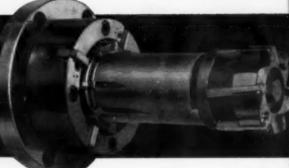


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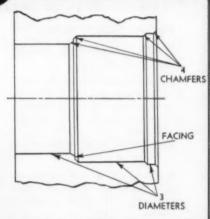


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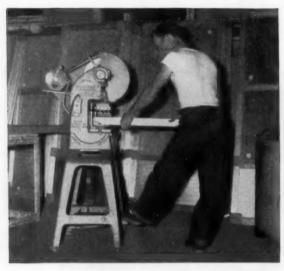
Mult-O Tools can also offer cost saving advantages for your production operations. If you use multiple operation, transfer-type machining in production, ask Barber-Colman Engineers for analysis and recommendations on cutting tools which produce maximum efficiency. Send part prints and production desired. A representative will be glad to discuss your requirements on request.

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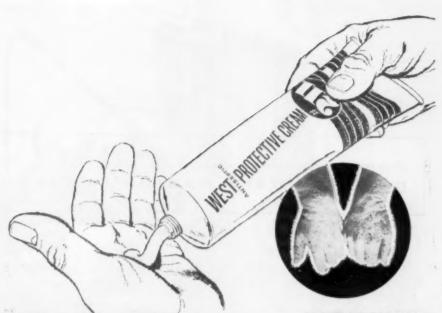


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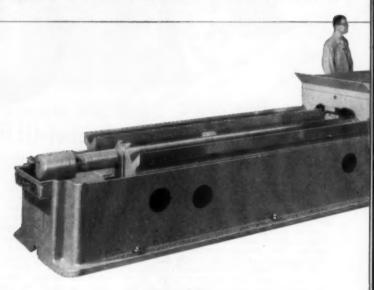
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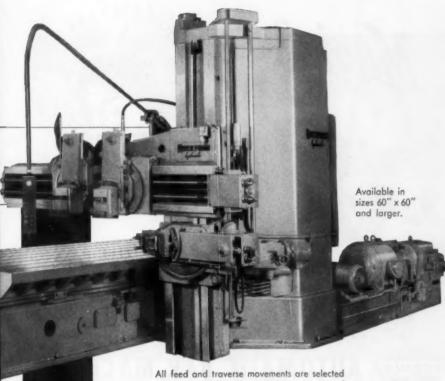
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77

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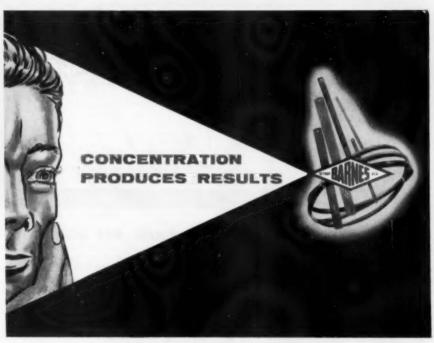


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This is another in a series featuring the views of owners of leading tool and die companies



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Page 97

Die Application at Victor. With 10 percent of their production in the "special" classification, calling for α short run of business machines with α special linkage or cam member, the Victor Adding Machine Co. effects numerous economies with their general purpose dies. This article goes into detail regarding Victor's adjustable dies for short run blanking, α general purpose inverted piercing die, and α forming die for right angle bends and offset bends. Winding up this informative article is α descrip-

Chemical Milling. Reducing the weight of a part is probably the most obvious use of chemical milling. A possible use that might prove extremely useful in the future is the milling of magnetic materials to specific shapes. Gas turbine blades should be produced with this method more economically. Manufacturers of appliances are discovering the economies of removing metal by chemical milling. This article presents some valuable tips to designers on how and when to use this new technique economically.

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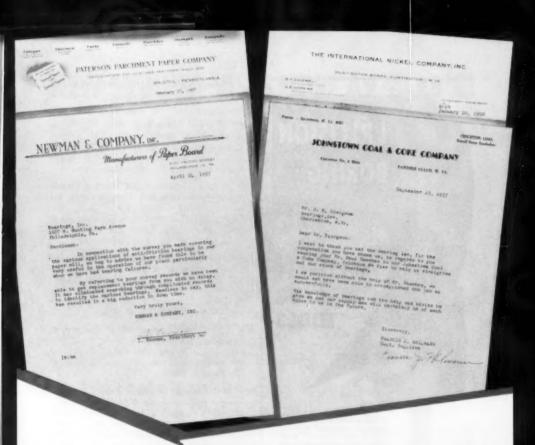
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Bearings, Inc. located the bearings in the equipment in these plants — we took the parts numbers of these bearings and converted them to the bearing manufacturers' numbers. All bearings in inventory were examined and, where necessary, cleaned and rewrapped.

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These companies now have the survey and the Bearings, Inc. branch that performed the survey keeps a copy in its files. Together they work to keep bearing inventories at the minimum with the Bearings, Inc. branch making certain that it is holding, in reserve, the bearings these companies might require for any emergency.

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Meetings, Conventions and Exhibits

Apr. 27-May 2—National Assn. of Architectural Metal Manufacturers 20th Annual Convention, Shamrock-Hilton Hotel, Houston, Texas. Headquarters: 228 N. LaSalle St., Chicago 1, Ill.

Apr. 30-May 2—Semi-annual Meeting, Grinding Wheel Institute and Abrasive Grain Association, Grand Hotel, Point Clear, Alabama, sponsored by Hunter-Thomas Associates, 2130 Keith Building, Cleveland 15, Ohio.

May 1-8—Annual Tool Show and Meeting of American Society of Tool Engineers, Convention Center and Ben Franklin Hotel, Philadelphia, Pa.; Headquarters: Mrs. Harry E. Conrad, Executive Secretary, 10700 Puritan Avenue, Detroit 21, Michigan.

May 12-16—Southwestern Metal Congress & Exposition, Automobile Building, State Fair Park, Dallas, Texas, sponsored by the American Society for Metals, 7301 Euclid Avenue, Cleveland 3, Ohio.

May 26-28—Triple Industrial Supply Convention—American Supply & Machinery Manufacturers' Association, Inc., Waldorf-Astoria Hotel, New York, sponsored by Hunter-Thomas Associates, 2130 Keith Building, Cleveland 15, Ohio.

June 8-13—Society of Automotive Engineers Summer Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 9-12—A national conference on materials handling, sponsored by the American Society of Mechanical Engineers, will be held in conjunction with National Materials Handling Exposition, produced by Clapp & Poliak, Inc., New York, at the Public Auditorium, Cleveland, Ohio.

Aug. 11-14—SAE National West Coast Meeting, The Ambassador, Los Angeles, Calif.

Sept. 8-11—SAE National Farm, Construction and Industrial Machinery Meeting, Production Forum and Display, Milwaukee Auditorium, Milwaukee, Wis.

Sept. 29-Oct. 3—ASTE Semi-Annual Meeting and Western Tool Show, Shrine Exposition Hall, Los Angeles, Calif.

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The rugged jaws, capable of withstanding tremendous strains. are machined to hold your finest parts without damage.

Opening Jaw Size Capacity 4" 4" 5" 5" 6" 6" 7"

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There are no slots or ridges .. no way for chips to get under movable jaw to damage vise or impair gripping power.



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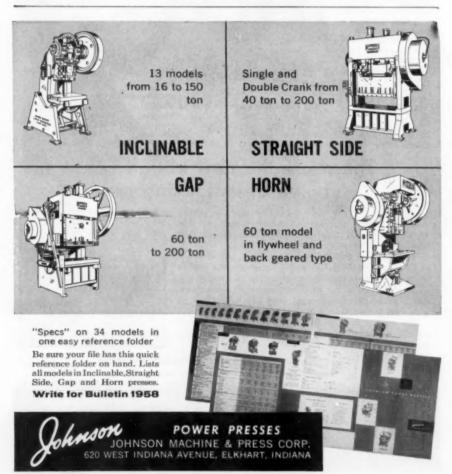
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Oct. 15-17—American Machine Tool Distributors' Association Annual Meeting, Sheraton Plaza Hotel, Boston, Massachusetts, sponsored by the Association, 1900 Arch Street, Philadelphia 3, Penna.

Oct. 27-31—National Metal Congress & Exposition, Public Auditorium, Cleveland,

Ohio, sponsored by American Society for Metals, 7301 Euclid Avenue, Cleveland 3, Ohio.

Nov. 5-9—Annual Convention—National Tool & Die Manufacturers' Association, 907 Public Square Building, Cleveland 13, Ohio, at the Sheraton Hotel, Philadelphia, Penna.



NEW! LOGAMATIC "400" Logan



SEE IT AT THE ASTE SHOW—BOOTH 625 MAY 1-8 FIRST of a new series of automated turret lathes, the Logamatic "400"—with 14-inch swing and 1%-inch spindle hole—puts profit in short or long production runs with an ease, accuracy and flexibility not previously available in its price range . . . See this versatile performer in operation at Philadelphia's Convention Center, May 1-8, during your visit to the ASTE Convention!

FOR MORE INFORMATION about the new Logamatic "400", drop a line to:

LOGAN ENGINEERING CO., Dept. H-558, 4901 Lawrence Ave., Chicago 30, III.



I would be very grateful to your good selves if you could send me copies of the complete series of articles on "Time Study" by Harold R. Nissley which appeared in your 1954 edition and the complete series of articles on the "Machining of Aluminum Screw Machines" appearing in your 1955 edition.

As one engaged as a Planning and Estimating Engineer and a keen student of work measurement I am confident that the above mentioned will be of great value to me.

Thanking you in anticipation

D. H. Murphy 140 Newark Road North Hykeham Lincoln, England

Chevy Pinion Line

Would appreciate a copy of article by W. F. Schleicher, "How Chevrolet Produces Pinion Gears," which appeared July, 1957.

IRVIN S. TARRSON Evanston, Illinois

Centerless Grinding

We would like to obtain two copies of the Machine Tool BLUE BOOK, Part 1, February 1947, through Part 4, May 1947, on Modern Centerless Grinding Practices, by D. E. Lower, Abrasive Engineer, Simonds Abrasive Company.

Thank you very much for your assistance.

HEINZ G. MARK PLANT SUPERINTENDENT Ex-Cell-O Corporation Detroit, Michigan

Advanced Mechanization

Please send me a reprint of the following: "Controls and Advanced

Mechanization" Machine and Tool Blue Book, July 1957.

ROBERT H. CULVER
PRODUCTION ENGINEER
AEROJET-GENERAL CORPORATION
Sacramento, California

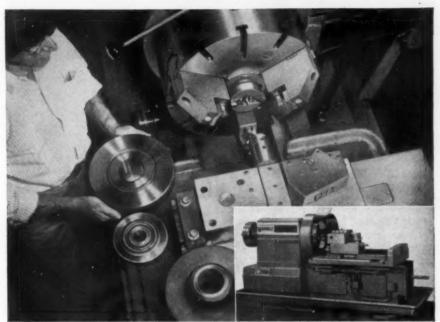
Reprints Desired

Please send me one copy of the following "Cut-Off Wheel Replaces Milling," "Today They Grind Titanium Routinely."

R. D. HALVERSTADT
METAL WORKING LABORATORY
GENERAL ELECTRIC COMPANY
Cincinnati, Ohio

Deep Hole Drilling

Recently I had the opportunity to read a reprint from your book entitled "How Douglas Solved its Deep Hole Drilling Problems." This article was written by A. R. Felando, Tool Research Analyst Methods Development Group, Torrance Facility, Douglas Air-



Smart planning on Simplimatic holds f.t.f. time to 1.7 min. on 61/5" diam., 3.3 min. on 103/4" diam. workpieces.

How OTM Corp. cuts costs machining parts in 13 sizes

Handles each part in single chucking, using Simplimatic with back-facing attachments and two-speed motor

You may get ideas from the way OTM Corporation, Houston, Texas, machines steel welding neck flanges and welding necks—with each part in 13 different sizes—completing each part in a single chucking and holding change-over time to an absolute minimum.

Here's how the job is done on a Gisholt Simplimatic Automatic Lathe: Facing, grooving, boring and chamfering operations are performed from tools on short tool sides, with T-slotted tops for quick adjustment. Relieving the boring tool at the end of the cut eliminates tool tracks. Simultaneously, a special back-facing attachment works through the spindle to shave-face and chamfer the O.D. on the hub. A power chuck wrench operates the scroll chuck and permits mounting this attachment in the spindle bore. A two-speed motor

provides correct surface speed and permits switching from high speed (for turning and facing) to low speed (for grooving operation) and back again, during the Simplimatic's automatic machining cycle.

Here, again, the Gisholt MASTERLINE Simplimatic Automatic Lathe saves a manufacturer the cost of a special machine. Its extra wide platen table provides ample space for an infinite number of slide and tool arrangements—and its table feed permits tools to engage with the work or perform additional machining operations before actual slide movements begin. Ask your Gisholt Representative to show you how the Simplimatic performs special machine functions at standard machine prices—on your product and under your production conditions.



GISHOLT

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WRITE GISHOLT TODAY for new Catalog 1159-C on Gisholt MASTERLINE Simplimatic Automatic Lathe. Shows 39 typical jobs—fully illustrated.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

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May, 1958

91

continued

craft Company, El Segundo Division and was dated June 1956.

If possible, I would appreciate receiving a copy of this reprint for my file.

> F. SCHMIDT DRILLMATION COMPANY Center Line, Michigan

Educating Engineers

Please send me three reprints of the article entitled, "Educating Engineers," by Paul Meline in the October 1957 issue of MACHINE and TOOL BLUE BOOK. Thank you.

EUGENE R. LEVITT ROCKET ENGINE SECTION GENERAL ELECTRIC COMPANY Cincinnati, Ohio

Broaching

I would appreciate receiving a reprint of your article entitled, "How To Estimate Broaching Time," which appeared in your March 1958 issue,

Thanking you in advance.

ALOIS SAUNDERS
METHODS ENGINEER
COLUMBUS MCKINNON CHAIN
CORPORATION
Tonawanda, New York

... Please send me the following reprints or tear sheets:

"Extruding Titanium Jet Engine Parts," and "How to Estimate Broaching Time."

I would appreciate an additional copy of "Grinding Applications at Solar Aircraft,"

> George J. Gosieski Racine, Wisconsin

SCHRILLO SUPPLY HOUSES STRIBUTORS WRITE DIRECTLY TO THE MANUFACTURER ALABAMA, BIRMINGHAM Ford Tool & Carbide Co. MOBILE: Oliver H. Van Horn Co., Inc. ARIZONA, PHOENIX Garrett Supply Co. TUCSON Industrial Tool & Supply Co. Industrial 1001 & Supply Co. CALIFORNIA, LOS ANGELES Garrett Supply Co. SAN DIEGO Hammond Machinery & Supply SAN FRANCISCO: C. W. Marwedel R. J. Storm & Sons COLORADO, DENVER Jarvis Supply Co., Inc. CONNECTICUT, Stratford The Ellsworth Steel & Supply FLORIDA, MIAMI Lafayette Tool & Supply ORLANDO: Mill Supplies, Inc. GEORGIA, ATLANTA Allison Machinery Co., Inc. HAWAII, Honolulu Lewers & Cooke, Ltd. Lewers & Coone, Lau. ILLINOIS, Chicago Anderson & White Supply Co. Midwest Surplus Tool & Supply Co. Manas Surplus 1001 & Supp Kansas, Wichita Lace Ind. Supply Co. LOUISIANA, New Orleans Oliver H. Van Horn Co., Inc. MAINE, PORTLAND Edwards Walker Co. Edwards Walker Co. MASSACHUSETTS, LAWRENCE United Tool & Industrial Supply MICHIGAN, DETROIT Dodge Tap & Tool, Inc. FERNDALE: Sterling Supply Co. MINNEAPOLIS Minnesota Supply Co. The Tool Crib, Inc. MISSISSIPPI, JACKSON Oliver H. Van Horn Co., Inc. MISSISSIPPI, JACKSON MISSORIE, JOPLIN ۵ MISSOURI. JOPLIN Industrial Equipment Co. KANSAS CITY Industrial Equipment Co. KANSAS CITY Brast-Eichman Mach. Corp., Inc. Fuchs Machinery & Supply Co. Laice Ind. Supply Co. ST. LOUIS: Mid-Land Supply Co. NEBRASKA, OMAHA Fuchs Machinery & Supply Co. NEW JERSEY, KEARNEY A. N. Nelson, Inc. NEW MEXICO, ALBUQUERQUE Equip. Sales & Mfg. Co. NEW YORK, BROOKLYN A. N. Nelson, Inc. NEW YORK, BROOKLYN A. N. Nelson, Inc. NEW YORK, BROOKLYN A. N. Nelson, Inc. NEW YORK: Burtley Tools, Inc. NEW YORK: Burtley Tools, Inc. NGCHESTER: Rochester Ind. Supply NORTH CAROLINA, CHARLOFTE The Textile Mill Supply OHIO, CLEVELAND 00 OHIO, CLEVELAND Strong, Carlisle & Hammond OKLAHOMA, OKLAHOMA CITY OKLAHOMA, OKLAHOMA CI Hart Ind. Supply & Equip. TULSA: Industrial Equip. Co. Luce Ind. Supply Co. OREGON, PORTLAND Davis Ind. Prods. Co. Davis Ind. Prods. Co. TENNESSE, KNOXVILLE Tennesses Belting & Supply Co. TEXAS, EL PASO Momsen Dunnegan Byan Co. FT. WORFH: Air Accessories, Inc. GRAND PRAIRIE: Texas A/C Supply Co. UTAH, OGDEN: Aviation Service Sup. Co. VIRGINIA, RICHMOND Virginia Tool & Equip. WASHINGTON, SEATTLE Dow Industrial Co. WEST VIRGINIA, CHARLESTON Baldwin Supply Co.



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- * QUICK SETTING GAGE INCLUDED

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M-50 5" dia. cutter (with 1-½" dia. pilot hole) 3, %" wide carbide inserts





♦ M-35 3-½" dia. cutter, 1-¼" dia. shank, 2 carbide inserts ¼" or ¾" wide

The new Manchester P.D.Q. Milling Cutters are made of heat treated alloy steel and are designed to handle the "tough jobs". Inserts may be changed in the machine. Exclusive double "V" clamp automatically registers the cutting tools. Designed for low H.P. machines. Special shanks available on request. Write



M-25 2-½" dia. cutter,
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2 carbide inserts
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Don't You Believe in Evolution?

The ASTE Tool Show again points out that we are in a continuous evolution of improving our methods of processing. It also points out where further improvements will be made in the future.

The one element in our industry that should see the show so they could evaluate the evolution that is taking place are the reactionaries who think the old way is good enough. These are the people who, when you give them an argument, give you a rebuttal that sounds something like this: "Those big operators who are using these automatic machines have learned many a lesson from us. When they run into a problem too tough for all their fancy machinery to solve for them, they come running to us. And we usually come up with a good answer. All we ever use is our good old standard machines and horse sense."

Such complacency if accompanied by an attitude that any member of a production team does not need to keep abreast of new methods, techniques and devices today and the next few years is certainly unwarranted.

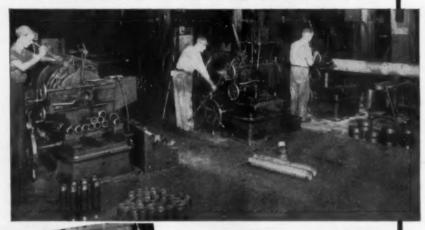
The small plant operator today must make an effort to become exposed to as much tooling and production information as he can. The fact that he is small means that he doesn't come in contact with as many machine tool representatives as the medium-sized or large operators and therefore doesn't get the benefit of their advice or information about what's going on in plants that are doing the same kind of work that he is. Now more than ever machine tool representatives are available as consultants. For years, small plant owners have been asking for machine tools with more flexibility when it comes to setting up a job because they work only on short runs or custom jobs. Machines that are fast and easy to set up are here today.

Of course, we have many small plant operators who don't fall into the above "reactionary" classification. The job shop has played an ever-increasingly important role in today's aircraft production program. This requires not only the right type of equipment, but the engineering skill to incorporate new methods of tooling. The author of one of our main features in this issue, page 105, has such a set-up in his California plant, and he expounds on some of his advanced techniques in contour machining.

Here is a man whose plant is always open to engineers for the common exchange of ideas. If this attitude becomes more prevalent, the job shop is sure to remain the backbone of industry.

PAUL A. MELINE
Managing Editor

LANDIS PIPE THREADING MACHINES—





1. WIDE RANGE—Just three LANDIS Pipe Machines (2", 8" and 18") will thread all diameters of pipe from 1/2" to 18". Each machine is constructed so as to handle a wide range of pipe sizes—for example, the 6" machine will thread all diameters from 1" to 6".

2. DIE HEAD EFFICIENCY—The design of Stationary heads provides maximum rigidity on all diameters within their range. Size adjustment is quickly and easily obtained through the use of a single locking nut.

3. LOW TOOL COST—Chasers operate at a tangent to the work. Line contact at cutting edge reduces friction. Permanent throat assures even chip distribution. Variable rake affords proper cutting edge for different materials. LANDIS chasers are useable for 80% of their original length.

LANDIS Machine CO.

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CUTTING-OF

"There is a great field for expansion of business by better salesmanship. We have got great savings. I believe that we have got to offer things in a better-packaged way, we've got to do better advertising, and above all things let the public buy when they think they are getting a bargain and not worrying about what is going to be the possible future of some possible future action."

President Eisenhower

President Asks Extra \$1.6 Billion for Defense for Fiscal 1959

Congress has received from President Eisenhower an emergency request for an additional \$1,592,300,000 for defense for the fiscal year starting July 1.

The new request is an adjunct to the \$39,145,000,000 of spending authority asked by the Administration in January, and would increase the total amount sought for defense to \$40.7 billion.

Top-priority aircraft and missile programs would receive most of the extra money, only about \$500 million of which would be spent in 1958-59. But this amount would be enough to boost actual outlays to about \$40.3 billion, a post-Korean War record.

Here is how the extra funds would be spent:

Twenty-nine B-52 bombers and

26 KC-135 jet tankers (both made by Boeing)\$423 million.

Two additional submarines to launch the Navy's 1500-mile Polaris missile\$323.5 million (Three such submarines were authorized previously.)

Development of the Army's Nike-Zeus anti-ballistic missile\$195 million.

Space programs being run by the Pentagon's Advanced Research Projects Agency \$140 million. (And lesser sums for development of missile programs.)

Procurement and research funds for Air Force \$577.1 million.

Procurement and research funds for Navy \$452.8 million Procurement and research funds

for Army\$245.8 million Procurement and research funds for A.R.P.A.\$180 million

Military construction\$136.5 million.

The Pentagon will divert already

available money to the most urgent programs at once and will not wait for Congress to provide the funds, a spokesman said. Chairman Mahon (D., Texas) reported that immediate consideration would be given the request by the House Appropriations committee handling military affairs.

Solutions to the Farm Problem

There appear to be plenty of solutions to the farm problem—the defeatism which accepts surpluses and subsidies notwithstanding.

New industrial uses for farm products could be discovered through expanded research. Increased consumption would result from the establishment of healthier eating habits.

Increased consumption is also obtainable through lower prices. Example: Retail meat prices dropped 21 percent from 1951 to 1956, and

consumption per capita increased 20 percent.

The voluntary movement of farmers to better-paying activities permits more satisfactory earnings for the remaining farmers. Since 1950, the farm population has dropped 20 percent as mechanization and productivity increased.

Evangelist Billy Graham has suggested to President Eisenhower that surplus farm products be used to alleviate the suffering of starving nations, such as India. This plan would seem to make sense, not only because it is humane, but also because a hungry man is sure to favor the government which feeds him, be it democratic or communistic in character.

But these realistic solutions require freedom for individual effort. They can never be fully effective while the farm economy is in a government straight jacket. Therefore, Walter Garver, manager of the Chamber's Agriculture Depart-

"If ether nations are curbed in trading with us, they will be compelled in self-protection to conduct increasing trade with Communist Russia. The result would be loosening their ties with us, subjecting themselves to Communist influences, and strengthening the Soviet economy and military clenched fist. Such a break-up would pave the way for eventual Communist domination."

Sinclair Weeks Secretary of Commerce



New Lamina Wear Plates Last Longer, Cost Less!

Now . . . save money and get better performance wherever you have sliding contact between flat metal parts! The principle of bronze electroplated on a steel backing originated with Lamina Bronze-Plated Guide Pin Bushings. Proven during countless millions of punch press hits, it is now being used successfully to produce flat wear plates.

This new concept in wear plate design combines the low cost, ready machinability and solid backing of steel with the long-wearing, non-seizing, free-running properties of a copper-tin bronze alloy. Lamina Bronze-Plated Wear Plates are



flat, parallel, and can be easily machined to suit your application. Standard sizes available from stock. End costly wear problems and reduce expensive downtime now! Write for complete information.

Manufacturers Of Lamina Guide Pins, Bronze-Plated Bushings, Progressive and Lamination Dies

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ment, recently requested the Senate Agriculture Committee to make a start toward freeing agriculture from government subsidy and control programs.

He asked that the soil bank's acreage and conservation reserves be terminated, that the government get rid of existing surpluses without market disruption, that the range of price supports be lowered, that acreage allotments be increased and that the escalator price support clause be eliminated from the existing law.

That, Mr. Garver believes, is the way to a healthy, self-reliant farm economy which can be a strong partner of business.

Alternatives to Imports

"There are only a few possible ways to finance or offset the present \$6 billion export surplus and any future surplus of U.S. exports above imports," says the U.S.

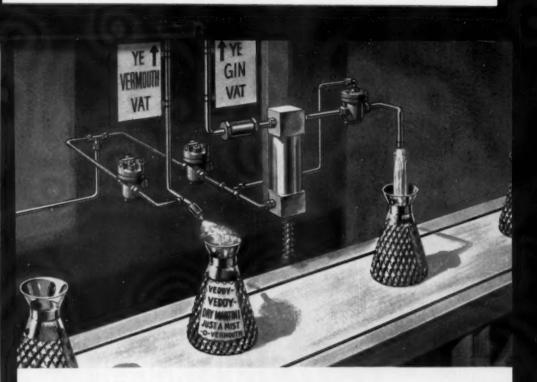
Chamber of Commerce. These alternatives are:

- (1) Foreign countries can raise their barriers against American products and reduce our exports to attempt to correct their external financial problems. This is most likely to happen if we raise our barriers against their products and, warns the Chamber, would increase any unemployment problems we now suffer and deny foreign markets to our most efficient producers.
- (2) Our foreign aid can be maintained or increased; that is, we can give away money, which in effect does pay for some of our present export surplus and would help pay for any increased levels of U.S. production sold in foreign markets.
- (3) Loans to foreign producers or governments can be maintained or increased. The U.S. government can loan dollars directly or indirectly by contributing funds to international lending agencies. How-

"We strengthen the chance that democracy and justice will win over tyranny by helping to make possible sound economic growth in places where for countless centuries the people have known only hunger, disease, poverty and stagnation."

> Andrew J. Biemiller AFL-CIO Legistlative Director

"How Business Publications Help Small Business" includes research data, legislative analyses, trade news, facts on personalities and trends, and statistical reports. Copies of this booklet, No. 91 of "Management Aids for Small Manufacturers," are available free of charge from the Small Business Administration, Washington 25, D. C.



What? Air Automates the Extra, Extra-Dry Martini!

The ready mixed Martini may never come to this but . . .

Don't bruise the Vermouth!" Maybe you subscribe to he idea of only a fog of Vermouth or maybe you like yours four-to-one.

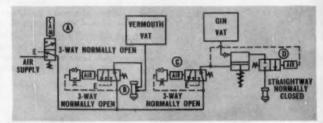
But, if it came to bottling this vogue-ish mixture, the ircuit here could certainly do it. Meanwhile it gives us fanciful way to show you how you can easily create an ll air circuit that does a continuous sequence of timed perations by using valves that can be both operated and sequenced by air.

EQUENCE OF OPERATION

- Conveyor indexes, opening cam valve
 (A). This introduces air to valves (B) and
 (C) which begin timing out. Vermouth is
 atomized by Vermouth nozzle, cylinder
 expels a measured amount of gin through
 master valve (D) which has been opened
 by air from the outlet of valve (C).
- , Valves (B) and (C) time out and close, stopping liquid flow.
- . Conveyor indexes again.

Triggering one operation with another and timing the operating periods—all with air—may save the day for you.

The same air involved in the main operation can also pilot these valves. What's more these valves can be preset to wait out a time delay before operating, or operate for a self-measured time. Using them you can create unlimited all-air automation systems which could just turn the trick where you wish to avoid electricity, or want to stick with just one power medium.



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Ross operating valve co.



120 East Golden Gate . Detroit 3, Michigan

ever, unless loans are to be extended indefinitely they must be repaid, and other countries must be able to earn enough dollars for principal and interest charges. In fact, the Chamber continues, lending abroad now suggests that in the future it may be necessary for the U.S. to encourage an import surplus.

(4) Private foreign investment is another way to help finance an export surplus. But if U.S. investment is to continue to make extra dollars available to foreign countries, there must be reasonable assurances that the earnings on such investments can be brought home and that this capital will not be permanently "locked-in" abroad or nationalized. Such conditions are possible only if the foreign countries can maintain satisfactory international financial balances-for instance, by exporting to dollar areas.

Participation Fee Reduced on Small Business Loans

To stimulate bank participation in its loans and at the same time to reduce loan servicing costs to the government, the Small Business Administration made effective April 1 a new schedule of reduced charges to banks for participation in loans to small businesses.

The new rates were made possible by action of the loan policy board on March 18 in reducing by 50 percent the participation fee charged by the Administration on its share of deferred participation loans. The Board also approved a service fee for those banks servicing immediate participation loans. The fee amounts to one-half of one percent per annum on the unpaid principal balance of the government's portion of the loan.

"Fire-Fighting Equipment for Small Plants," No. 59 in the series, Technical Aids for Small Manufacturers, informs the reader of private and public protection systems, types of private fire protection equipment, fire-fighting equipment required in a small plant, maintenance of the plant's fire-fighting equipment. Copies of this Aid are available free of charge from the Small Business Administration, Washington 25, D.C.

"Our analysis would indicate that if the public is to be protected from unreasonable monopoly power, a body of law appropriate to the labor mark has an importance at least equal to that which (in the United States) is generally taken for granted in the product market."

Professor E. H. Chamberlain Harvard University



always measure up!



Socket screw users who want what they want when they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products always measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

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Cost Savings with Advanced Tracer Techniques

Here's how one job shop integrates proper planning with tooling to get maximum results from tracer equipment

By **Clifford Shinn**, president Shinn Engineering, Inc. Santa Ana, California

 Our tracer control program consists of a total of six converted planers operating, or in various stages of completion, two additional specialized pieces of tracer equipment just coming out of design, and projected plans for three tracer planer mills, one of which will be a shaper/planer combination. Almost everyday some of my people approach me with new ideas for accomplishing some type of job better through tracer applications.

It is extremely important to have the proper planning and tooling programs necessary to insure maximum "usability." At Shinn Engineering, we have developed an integrated planning—tool design department. The planner on the job is also responsible for the design of the tools. This insures that the tools will be congruous with the original planning ideas. It is mandatory for the planner and/or tool designer to have some actual experience with tracing equipment.

Tooling

The tools involved play a considerable part in the success or failure of any given job. It is impossible to suggest any empirical formula for determining the type, size or cost of the tooling best adaptable to tracer work since this depends on so many variables: The quantity, the intricacy of the job,

". . . Tracer controls will turn out your product in half the time

the chance for repeat, what the quotation requires, etc. There are a variety of solutions and each one has its own application.

A categorization of our tooling solutions would be as follows:

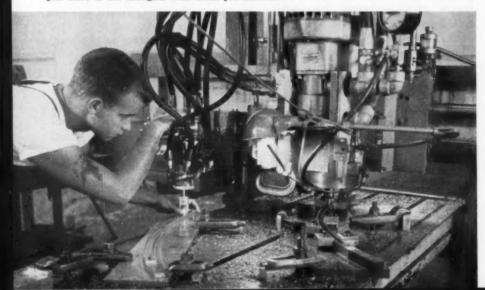
1) QUICK AND DIRTY TOOLING: Usually manufactured from photo shots or some other loft data. Can be stiffened, if need be, by 3/16" aluminum back-up plate. Applies mainly to short-run prototype 360° type contouring, but 3-D work can effectively be done with a simple wood overlay. This type of tooling is the least costly, but of course requires more hand work.

(2) Wood Patterns: For more complex shapes—but still limited quantity, where cost, in order to get the job in the beginning, is important. Also wooden patterns are frequently furnished by the customer as "masters."

(3) PLASTER SPLASH-TYPE PATTERNS: Are dictated where the customer furnishes splash, wood, or sample part masters that cannot be used themselves. A quick "splash" of the contour with a metal or even wood base is adequate.

(4) 3-D PLASTER CARVINGS: Slightly more difficult to build

Contouring 4130 steel slat tracks, heat-treated to 180,000-200,000 psi. Part is for Douglas A3D twin jet bomber.



and with .005" tolerance."

but about the only solution when coordinate "tracers" are all that are furnished. We fabricate a series of short aluminum templates from the "traces" at the various wing or fuselage stations given, then construct a 3-D coordinate graph which is then filled with some plaster or plastic material. Upon solidification, the plaster is literally "carved" to blend smoothly between the known stations—the result being a rigid 3-D pattern.

(5) "SAMPLE PART" TOOLING: This method requires that the first run be fabricated by one of the previously mentioned quickfix methods and at the same time duplicating an extra sample part. This extra "sample part" or "master" usually has some type of attaching or locating surface; and is, of course, used for every succeeding run. This method is particularly adaptable to large or medium sized quantities with several different runs.

(6) CLASS A-METAL TEM-PLATES: Are the most expensive to build, but also are the most durable. They can be made from any material, but of course aluminum is the most popular. In case a template must be

Slat-track superfinishing machine, showing two positions for work.

changed during the "prove and complete" process, we frequently use "Devcon" or some other material of that type to repair the tool—the old adage of not being able to buy a tool that can "put on" material is not entirely true when discussing tracer techniques.

Setups

Many people have asked about our methods of "quick-fix" setup. How can the endless alignment tasks be avoided? There are many solutions, but I think ours is one of the simplest. After the machine has been completed and accurately leveled, we machine the sides of the T-slots exactly parallel to the longitudinal travel-each fixture has two locating dowels protruding from the bottom. When the dowels are indexed against the T-slots, the tool is located "right-on" transversewise. From there, it is a simple matter to juggle your center spacing by moving the valve, there being only one variable left.

We have also found the alumi-

num base plate with flop-over templates very satisfactory for right and left hand combinations of parts.

Another important "jigging" method which bears re-mentioning is the "center method." Any part whose general configuration lends itself to being supported between three centers (not necessarily inherent in the part) can be fabricated in this manner. The template is revolved at the same rate or indexed to the same relative position with the result that a completed part is generated from a blank of material also supported by corresponding centers. The centers are, of course, machined off in subsequent operations.

Methods

So far as I can determine, the tracer limitations existing upon available equipment do not stem from the tracer valves or any part of the hydraulic accessories. Given a tracer vehicle of unlimited rigidity, unlimited power, and a holding fixture that will not budge, the tracer controls will turn out your product in half the time and with .005 total tolerance, if necessary.

We have successfully profiled materials in the "harder" class with but only one change in our hydraulic variable-speed spindles. We have added inertia flywheels to all our hydraulic spindles which eliminate the "surge" experienced at low speeds when machining high heat treat chrome-nickelmolly steels, 17 PH compositions, titanium, or any of the other so-

called "tough materials.

"Double jigging" is a term we use when a relatively long run warrants a double set of tracer tools. The machine is then operated by two men—one operator and a helper who loads and unloads. This situation is particularly attractive since the burden rate for the second man is sharply reduced and he is in effect producing almost as much as the operator. This method also affords an excellent opportunity to train new men.

Special Applications

There are endless examples of cost savings through tracer controls, but for our purposes I have selected four typical types of jobs: slat tracks, flap tracks, gun tracks, camera tracks, canopy tracks and ejection seat rails.

We are presently manufacturing a high heat treat steel slat track in relatively large quantities. It is made from 4140 chrome moly steel—heat treated 180,000 to 200,000 psi. This track has a typical "H" cross section which is roughed-out before forming.

After the forming and heat treat operations have been completed, the parts are profiled inside and out on a variable speed hydraulic

spindle planer.

The curvature and finish requirements for all tracks are very stringent. For this reason, and to avoid a costly contour grind operation, we have developed what might be termed a "track superfinisher" which will be discussed under "Special Equipment."

The important point is that we are able to profile high heat treat steel or titanium, for that matter, with a root mean square surface roughness of 60 maximum.

Bulkhead Fittings

We are currently nearing com-

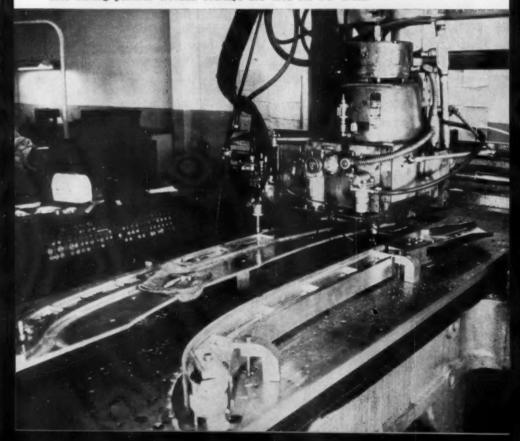
pletion on a series of bulkhead fittings which sprang from original orders for only three pieces of each of three separate configurations. In assembly, the three components form the entire bulkhead structure.

Our solution to the problem was a series of "overlays" which we fabricated from stiffened photo shots furnished by the customer. All 3-D swarf areas were accomplished with simple wood overlays.

Fuel Tight Wing Fittings

Sealant corners for fuel-tight wing fittings are typical center-

Contouring fuselage buikhead for Douglas A3D jet, showing simple stiffened photo shot tracing pattern. Wooden overlays are used for 3-D areas.



jigged 3-D jobs. This centersupport approach is particularly adaptable to such parts because they can be duplicated with little error whereas with conventional methods they become extremely difficult to even fabricate.

We are now in the process of producing several such fittings of this type from Hogout. These jobs have been very successful primarily because there is a large amount of 3-D work on them, and the quantities have been good. As an example, we are now able to rough the complete inside contours of a gas-tight fitting roughly 9" x 11" x 5" in slightly less than one hour jig time. The two finishing operations required after heat treat take an additional two hours to complete. With performance such as this from our tracers, we, of course, are convinced of their practicality.

Profiling Small Parts on a Large Planer

A typical example of the usefulness of tracer controls, even on smaller configurations, is a 431 Stainless Steel Rocket Pod "Detent" we are now making. For this application to be practical, the quantities must be large in order to offset the initial tooling costs. Our experience with this type of job is as follows:

The job was planned for a 10 foot planer with variable speed spindle. It was double-jigged

with 10 positions in each fixture. The results of our cost analysis show that the time required for this operation was cut to approximately 35% of that required for the original hand-profiled method. This not only provided greater profit, but has also helped us a great deal in maintaining the tight delivery schedule required.

Specialized Equipment

In any discussion of specialized equipment for producing aircraft components, the term "swarf" most certainly has a place. Our methods for producing swarf cuts are relatively simple. I think we all agree that there are basically three methods of developing "swarf" cuts:

- 1. "Swing" the part
- 3-D "waterfall"
 "Swing" the cutter

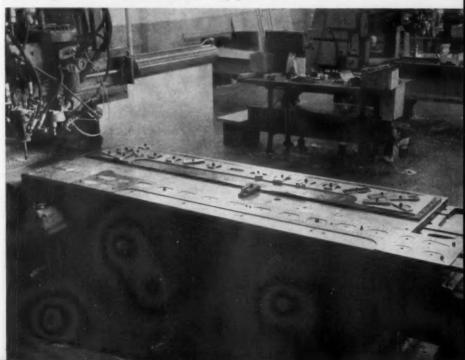
Not too many parts have a straight-line swarf; therefore, I will spend little time discussing Method No. 1. We have successfully used this method by actuating the fixture mechanically—using a system of trunnions to develop the "swing," and using a cam bar to control the "rate of swing." Method No. 2 is, of course, satisfactory but very time-consuming if there is much 3-D work to be done. Method No. 3, in my opinion, is by far the best—depending upon the job, of course.

Having analyzed the basic re-



Center jigging method for coordinating pattern and workpiece while 3-D contouring fuel tight corners used in wet wing (airplane classified).

Contouring 17-7 PH stiffener for DC-8, using photo shots.



quirements for most swarfs, we feel that it is not economical to tool a \$30,000 machine to perform a simple, light operation—in which category most of these cuts fall.

We are now in the process of constructing a simple, light, highly specialized machine which will accomplish almost any external swarf; and which, with modifications, will do the internal type as well. The budget for this machine has been established at \$1500.00.

Another specialized machine which, unlike the one mentioned

previously, is all our design, is our "track" machine. Our need was a piece of equipment that would super-finish all sorts of tracks. The answer was a sanding belt mounted on precision wooden drums with the aid of double-sided mastic tape. The whole affair moves with a combination of linear and circular motion so that any inherent deformities of the drum or belt cannot damage the part being sanded. A high degree of skill is not required to operate the machine and it does an excellent job.

Contouring rocket ped detents on a 10-ft. planer mill using double jig, 10-gang, tooling methods. This reduces machining time over hand profile method by 400 percent.



Reducing Time Cycles up to 70% with...

Vibrating Barrel Finishing

• A new barrel finishing system makes it possible to barrel finish inside diameters. Based on a machine called the "Vibraslide," the system combines the principles of rotation and vibration to produce extremely rapid results during cutdown cycles; and is capable of utilizing either principle alone.

Many parts that were previously not adaptable to barrel finishing because of material or design can be done in the vibrating barrel built by B. W. Elliot Mfg. Co., Inc., according to a spokesman for Minnesota Mining and Manufacturing Co., St. Paul, which has exclusive distribution of the "Vibraslide." Rotating speeds range from four to 20 RPM. The speed of the vibrator is fixed at 2,300 cycles per minute, and both ends of the barrel are synchronized with timing belts so that vibration is uniform throughout the media.



This part posed two problems: (1) the burred edge around the small hole, and (2) the threaded I.D. With the vibratory method, the small hole was completely deburred and I.D. smoothed; threaded I.D. smoothed to specification.



Problem: to deburr and generally refine the small radii. Placed in "Vibraslide" machine for 1½ hours, 2,000 parts per load, finishes up to original specifications were achieved.



Load ratios and water levels presently used for standard barrels are satisfactory starting points for determining a "vibraslide" charge. — Minnesota Mining and Manufacturing Co. Photos

Short Run Press Tools

Blanking, forming, piercing dies have adjustable features

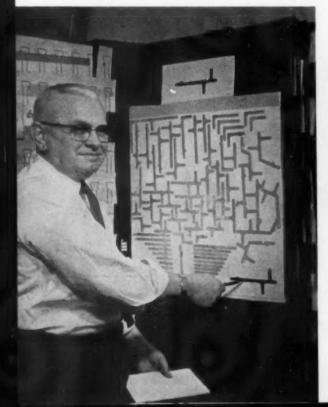
By **Paul A. Meline** Managing Editor

• In a plant producing business machines, such as Victor Adding Machine Co., there are many instances where small lots of small

stampings must be produced. By the use of short run press tools, small lots of work are handled economically and to advantage in all respects.

One reason why the need for

Fig. 1-A. Walter Jaske, manager of Victor's model shop, points to master blank from which all other blanks on model board were made with the aid of a bench sheer and radius die. Some samples show two blanks fastened together.



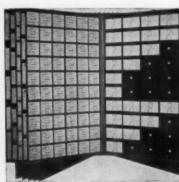


Fig. 1-B. Planning board, product of Victor's Industrial Division, serves as model board in the model shop.

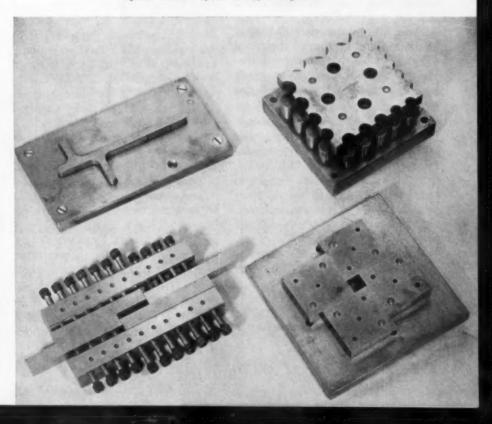
Cut Costs at Victor

new dies on small production runs is held to a minimum at Victor is through the judicious use of a Production Planning Board, which displays all model parts and is located in the model shop. (See Fig. 1-A) A close check of the eight panels of this board often saves the time and expense of having a

blanking die made for a new part.

There are many parts serving as linkages in the mechanism of a calculating machine. With approximately 10 percent of the models produced being of the "special" classification, any part that has to be produced to serve as a linkage or cam to provide an operating

Fig. 1-C. Upper left shows punch die which blanks part from which all parts displayed on model board are made, after being sheared and radius trimmed on radius die, upper right. Below, is adjustable blanking die for blanking any size from 7/16-in. x ½-in. to 7/16-in. x 2 ½-in. Bottom right is self-adjusting die for square blanks ½-in. to 1½-in. square.



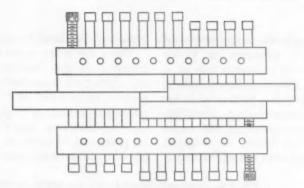


Fig. 1-D. Self-adjusting die for low production of rectangular shaped blanks.

feature that is not standard could call for a new die.

From the master part displayed at the top and bottom of the panel (Fig. 1-A) all the other parts displayed on the panel were made by using the bench shear and the

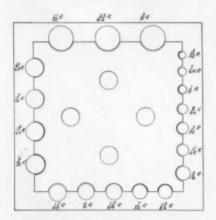


Fig. 1-F. Radius die for trimming radii in sizes from 3/32-in. to 3/8-in.

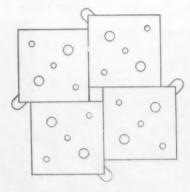


Fig. 1-E. Self-adjusting die for low production of square blanks.

radius die. This radius die, illustrated at top right of Fig. 1-C and in the line drawing in Fig. 1-F, is designed to trim any radius from 3/32-in. to 3/8-in. from the blank.

Two self-adjusting, low production dies made of hardened tool steel are illustrated in the bottom row of Fig. 1-C and Fig. 1-D and 1-E. Any square blank from 1/8-in. to 1-1/4-in. square can be stamped quickly with the die shown in Fig. 1-C and 1-E. This die is made from four tool bits ground square. The self-adjusting die in Fig. 1-C and 1-D can be used to blank any size

from 7/16-in. x 2-1/8-in. to 7/16-in. x 1/2-in. Note screws which hold the tool bits to the size desired.

A standard punch holder is used for both the self-adjusting dies. The punch is made from cold rolled steel taken off the shelf and ground to the size of blank wanted.

Standard Form Die with Adjustable Feature

In producing business machines, dies are made in great variety for all classes of work at Victor. To eliminate the necessity for new bending dies when a special linkage is required in a limited number of calculating machines, Process Engineer Daniel Moynihan designed the tooling for a die set in which right angle bends up to 90 degrees and offset bends can be

formed. (See Fig. 2)

The tooling in Fig. 2-B is designed to produce an offset angle between two parallel planes. For offset forming of this nature, four blocks are ground to the size and shape desired in the three angles for the series of piece parts to be formed. A shim is usually required at the point of the upper die as shown in Fig. 2-B to get the type of corner desired. This may be to the bending line if a sharp corner is desired; on those pieces requiring a radius, the upper die is shimmed to the point where the

desired radius is tangent to the flat. The maximum thickness of stock to be formed by this process is .094-in. The illustrations show a set-up for .094-in. stock. If the stock was to be .042-in., for example, this would require a shim of .052-in.

Location of the piece part may be accomplished by making a nest. (See Fig. 2-E). If the part is of such a nature that it is more desirable to locate it over gage pins, this detail in Fig. 2-E is modified

accordingly.

Fig. 2-D shows a different set of punch and die blocks for the same die set. This illustration shows the dies set up for a 90 degree angle bend. When any other angle up to 90 degrees is desired, two other blocks must be designed. If the punch is made one-inch thick, it is possible to shim the punch block so that different stock thicknesses may be formed with the same punch.

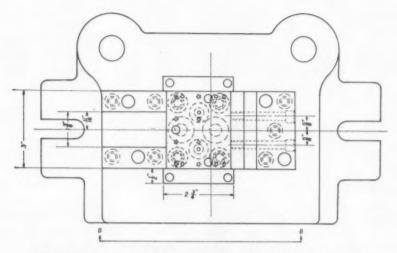


Fig. 2-A. Plan of standard forming die with adjustable feature.

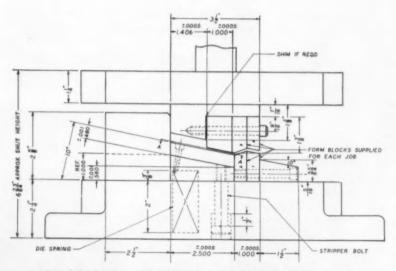


Fig. 2-B. Cross-section "B-B", front elevation, with tooling set up for forming offset bends.

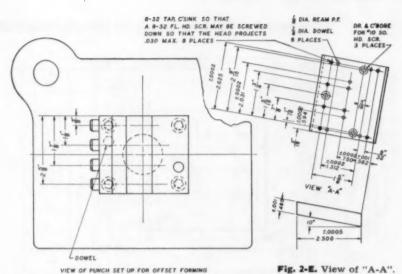


Fig. 2-C. Plan of punch member of forming die.

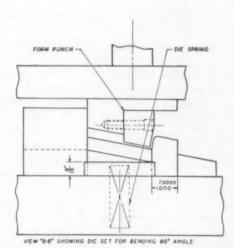


Fig. 2-D. Cross-section of standard forming die with tooling set for right angle bends.

In a line built up largely of stamped elements, a

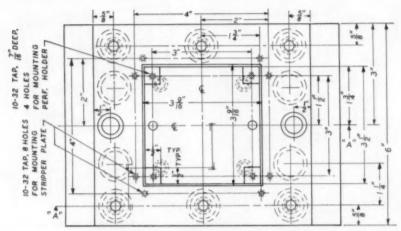


Fig. 3-A. Plan of general use piercing die.

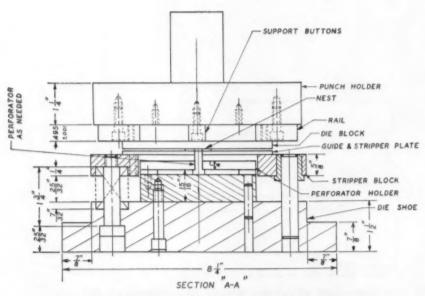


Fig. 3-B. Section "A-A" of general use piercing die.

general use piercing die finds many uses on short runs

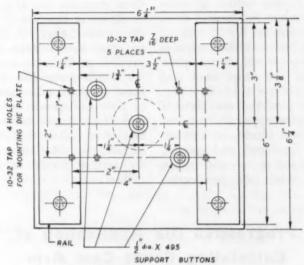
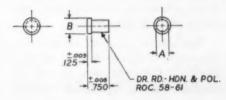


Fig. 3-C. Plan of upper die member.

Victor finds many applications can be made with the general use piercing die illustrated in Fig. 3. This is an inverted type of die; the die block is at the top while the perforator holder occupies the position below. As will be seen in Fig. 3-D, each newly designed part requires a nest to be attached to the guide and stripper plate; standard perforators are supplied with



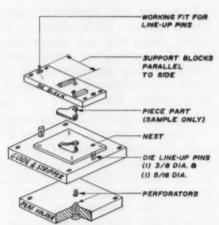


Fig. 3-D. Details of tooling for general purpose die.

Fig. 3-E. Type of perforators used.

each set of piercing tools made.

The perforator holder is made from low carbon flat ground steel. The dimensions are $\frac{1}{4}$ x $3\frac{1}{4}$ x $3\frac{1}{4}$ in., as this size best suits their requirements. The guide and stripper plate is made of the same steel and measures 3/16 x 4 x 4-1/2-in. Fig. 3-C shows how the die plate is mounted to the upper die member.

The support blocks, or buttons, which are hardened and ground, can be welded or screwed to the die block. While the perspective

shows rectangular support blocks, these supports can also be round, as shown in the plan of the upper die member, Fig. 3-C. If rectangular, the blocks must be joined parallel to the side as shown in the perspective. The number of these supports and their location, of course, depends on the thickness of stock, number of holes to be pierced and the size and location of the holes. Maximum height for the support blocks or buttons is 495-in.

Progressive Die Application of Calculating Count Cam Arm

Victor has gone more and more into progressive die application in recent years. Fig. 4-A shows the arm of a calculating count cam which formerly was blanked on a pierce and blanking die and shaved on a shaving die.

The part is produced today with a 3-stage progressive die, which notches, pierces, shaves and blanks. The strip stock is electro-copper coated cold rolled SAE 1010 steel, 2%-in. wide by .050-in. thick. The method of running the stock through the dies will be understood from the illustrations on the following pages. The first stroke of the press notches and pierces

the two pilot holes, trimming the radius with an allowance of .004-in. for shaving. With the second stroke, the three holes are pierced and the radius at top, which must have a smooth edge, is shaved. The reason these holes are not pierced at the first station is because the relationship cannot be held if the pierce and shave operations are not done at the same time. Incidentally, at the end of the radius, or at the point where the shaving ends, the slight step is permissible.

The amount of stock allowed for shaving contours is .004-in. on thin stock. In this operation, as well as in the shaving operation around

Problem: How to retain the slugs in the die opening

the tails of similar parts for cams, there was a tendency for the slugs to pop up instead of remaining down in the die when .004-in. of stock was allowed around the complete opening during the notching operation. (See Fig. 4-F.) When .008-in. of stock was left around that portion that was not to be shaved in the next operation, this provided sufficient body so that the slug was retained in the die opening.

Only copper coated stock is used on this application. The portion of the part below "A-A" in Fig. 4-A is stripped of the coating and then heat treated. This causes the flat surface and periphery of the part below "A-A" to be case hardened. The balance of the part will be soft, so that any warpage can be straightened.

Note in Fig. 4-B, the plan of the punch, that by jig boring holes as shown in Fig. 4-E, positive location is possible. All that is necessary to do is to press the perforators into retainers and turn until correct location is attained.

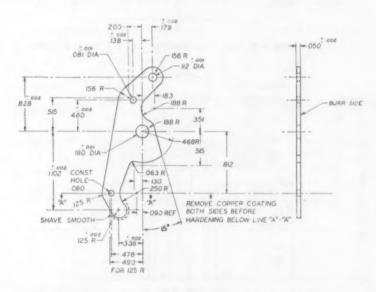


Fig. 4-A. Arm of calculating count cam, which is notched, pierced, shaved and blanked on a 3-stage progressive die.

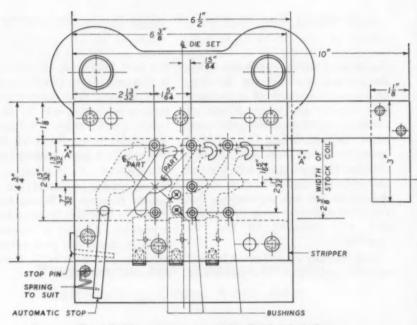


Fig. 4-B. Plan of progressive die, showing 3 stations.

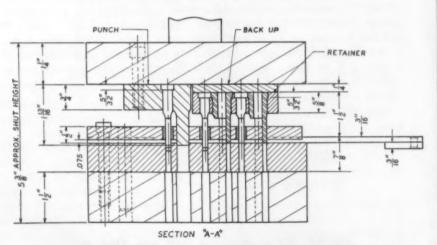


Fig. 4-C. Section "A-A" front elevation of progressive die.

On long production runs Victor has cut costs by including shaving in a progressive set-up like this

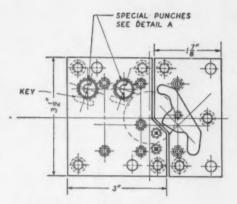
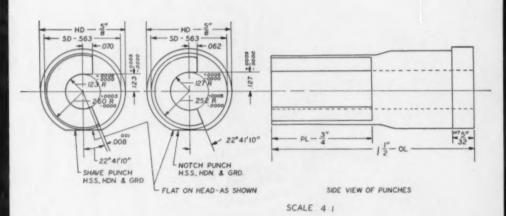


Fig. 4-D. Plan of punch.

The notch and shave punches are specials, as shown in Fig. 4-E. Victor has had experience with square shanks and have made punches with standard stock for base and mounting a turned portion separately. It is believed savings are realized by buying round punches from the perforator houses and taking this phase away from the shop.

Stripper bushings are specified because of the close tolerances that must be held.



DETAIL A
TOLERANCES HELD ON PERFORATORS

Fig. 4-E. Detail of shave punch, left, and notch punch.

See next page for details of stations



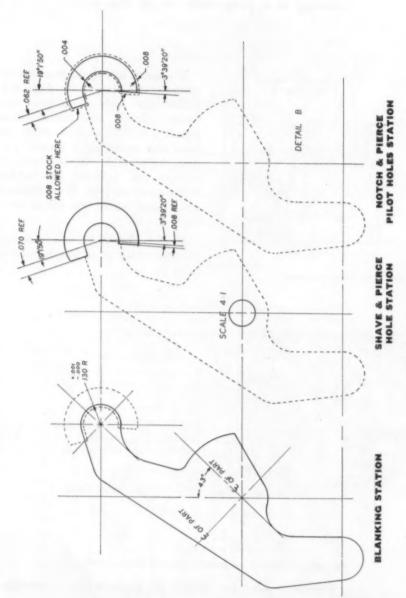


Fig. 4-F. Detail of 3 stations.

Looking Ahead with Chemical Milling

Some valuable tips to designers on how and when to use this new technique economically

By **Sullivan**Assistant to the President
United States Chemical Milling Corp.

• The basic operations that can be done with chemical milling can be divided into four categories: weight and size reduction, cutting, and tapering. Reducing the weight of a part is probably the most obvious use of chemical milling. The weight reduction can be an overall reduction or it may be restricted to certain areas.

Often it is necessary to make a part heavier than what is really required because of the forming operation that is used. An example of this is in the casting of centrifugal impellers for air compressors. These impellers are very thick in the region of the shaft. To provide

proper cooling after casting the rest of the impeller must be made thicker than is needed to maintain the proper stress levels in the wheel. This increased weight increases the centrifugal loads on the shaft bearings, and in the wheel itself. By removing the excess material from the back of the wheel, the loads on the shaft and bearings are greatly reduced. The safety factor in the wheel will be increased since the centrifugal forces have been reduced.

A similar application is frequently found in extruded or forged parts. It is often necessary to make certain sections larger than desired so that the material will flow properly during the forming operation. An extruded aluminum channel, for

example, was chemically milled to reduce the thickness of the sections from .044 in. to .016 in. This job could not have been done as economically by a machine tool.

There are many applications that could be shown where chemical milling has been used to reduce the size and weight of a part. Size reduction can be used to simplify fastening, packaging, and similar problems. There are cases where the shape of a part determines the forming process that must be used. For example, a narrow section of a part was so small in relation to the rest of the part that forging did not allow the material to flow properly. Even though forging provides better physical properties and a lower unit cost, the designer is forced to have the complete part cast. This type of problem was solved by making the narrow section oversize for forging and then reducing to the proper dimensions with chemical milling. A better product and a lower unit cost were obtained by chemical milling.

Future Possible Applications

A possible use of chemical milling that might prove extremely useful in the future is the milling of magnetic materials to specific shapes. Most machining operations destroy the magnetic properties of a magnetic material. Chemical milling will make it possible to mill materials that have been magnetized

without changing their magnetic properties. For example, alnico steel alloys, from which most magnets are produced, are impossible to machine even with carbide tools. If areas must be machined, steel inserts are cast into the material and later machined to the desired shape. This procedure is obsolete when chemical milling can do the job better and easier.

Fabrication costs, based largely on labor, comprise the major portion of the production costs of many items on the market today. Therefore whatever the designer does to reduce these costs should result in more profit for the manufacturer. The use of chemical milling to reduce the total number of parts in a product is a promising area for design innovation.

Sheet metal panels, such as those used for the hood and trunk lids of automobiles, are especially suited for this sort of design simplification. Actually a fairly thin sheet can be used to carry the loads but the resulting piece is not rigid enough. In order to add rigidity the outer skin is usually attached to a stiffening frame.

In the case of the trunk lid, the cost of the lid is increased considerably by the addition of the stiffener. This stiffener is kept as light as possible by using specially designed sections and lightening holes, and this results in a considerable amount of scrap material.

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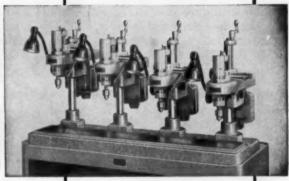
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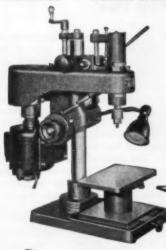
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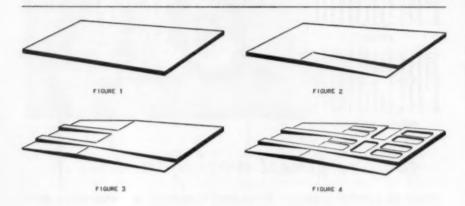
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Welding of the stiffener to the outside skin is extremely important because if both parts are not held firmly in the welding jig a warped lid will be produced. Addition of the stiffener has increased the



Ultra-Complex Nine-Step Part

This complicated part is formed by chemical milling in quantity production at United States Chemical Milling Corp.

Involving three different taper angles, the desired shape requires nine different milling steps. After the plate has passed through staging and been thoroughly cleaned (Figure 1) a coating of maskant is applied. This coating restricts the removal of the metal to the exposed areas. After masking, the area in which the first cut is to be made is scribed with a sharp tool and then the maskant is stripped from the area to be milled.

Following this, the first cut, which is a taper, is made by controlling the rate at which the part is immersed into and withdrawn from the chemical solution. Upon completion of the first cut (Figure 2), the exposed section is masked again and two other areas are each scribed, stripped, and tapered (Figure 3).

After all three tapers are completed,

the part is again remasked so that there are no exposed areas. The area of the deepest cut is then scribed, stripped, and milled. Since each of the remaining five steps represents a shallower cut, no further masking is required. As each succeeding area is scribed and milled, additional metal is removed from the exposed sections in order to bring all six cuts to their final, specified depths at the exact same moment. The finished part (Figure 4), with every section milled to exacting tolerances, is then ready for installation in the vehicle for which it was designed.

This is a graphic example of the design potential, which has been vastly broadened by USCM and its method of manufacture. A single integrally-stiffened part has displaced nine separate pieces, which heretofore would have had to be riveted, bonded, or welded together to form a sub-assembly with structural weaknesses and higher manufacturing costs.

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weight of the lid, increased the fabrication costs, and increased the reject rate. The lid could definitely be improved by chemical milling.

The lid would be originally formed out of thicker stock than if a stiffener were used. Then the underside of the lid could be chemically milled leaving some stiffening ribs around the outside and maybe two that crisscross from opposite corners. The result is a much superior lid that cannot be manufactured in any other way.

Another similar application in sheet metal construction is where the corners of two panels are joined. In the construction of sheet metal cabinets, such as those which house many of the large electronic computers, it is necessary to run a piece of angle iron in the corners for reinforcing. In order to use chemical milling the piece would be formed out of thicker stock than that which would normally be used. Then the necessary angles for fabrication are formed on the sheet. All of the section except the corner areas are chemically milled to the thickness that would normally be used. The result is a much stronger and neater panel. Thus the need for an extra reinforcing piece has been eliminated as well as about half the time required for fabrication.

Producing Turbine Blades

Chemical milling can also bring

the gas turbine and free piston engine a step closer to being installed in automobiles, trucks and buses. One of the major problems that has not been solved, up to now, is how to reduce the price of the turbine blades. Materials exist that will meet the requirements of an automotive gas turbine but they are very expensive and virtually impossible to machine. Super alloy steels have been used for aviation gas turbines but these alloys are extremely difficult to machine because of their hardness. The individual machining of each blade is not economically feasible for an automotive gas turbine. Chemical milling can be used to produce turbine blades economically.

The hardness of an alloy does not affect its ability to be chemically milled. Hard and soft alloys are chemically milled on the same principle. Also it would be possible to mill thousands of blades at the same time because the number of blades that can be milled at one time is limited only by the size of the tank used. Any one of several forming operations could be used to make the blade, and then chemical milling could be used for such things as tapering of the blade.

Since a gas turbine engine is usually not very efficient thermodynamically, special devices are used for automobile applications to make this engine more economical. One such device often used is a ring ALL THE PRECISION YOU'LL EVER NEED



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around the outside of the turbine blades. The ring is called a shroud. The shroud decreases the losses in the turbine and thereby increases the efficiency of the engine. Shrouds are composed of small segments that are formed integrally with each blade. Because problems encountered in forming shrouds, it is sometimes necessary to make the shroud segments thicker than required, however, this creates high stresses in the blades. Chemical milling can be used to reduce these segments to the minimum required thickness, reducing stresses in the blades and increasing their life.

Since the most critical operation will probably cause the most rejects, each part should be designed so that the most critical operation is performed first. If a part is to be rejected, it should be rejected as early as possible in the manufacturing operation. However, this may not always be possible, especially in the case where all cuts are finished at once, as in step cuts.

Special Design Tips

Extremely close tolerances can be held during chemical milling, but naturally the larger the tolerances are, the easier a part can be produced and the lower the cost will be. Depth tolerances are in addition to the original material tolerances. On cuts of 0.125 inch



Fiberglas laminate is the only practical means of producing a template for complex shapes.

or less the standard tolerance is ± 0.003 inch and ± 0.005 inch on deeper cuts. On very light cuts the tolerances can be held considerably closer.

A dimensional tolerance of $\pm 1/32$ inch is generally recommended. However if the sections that are milled are very thin and have complex curves a tolerance of $\pm 1/16$ inch may have to be used. A local deviation of $\pm 1/32$ inch in line definition is realistic.

Grain orientation will affect the final surface finish because an etchant works on the crystalline structure of the metal. The orientation of the grain also affects the strength of a material. Designers



Parts are scribed after maskant is thoroughly cured. Templates guide scribing on flat or contoured shapes to produce the desired pattern in finished part.



Maskant is removed by stripping it from areas to be chemically milled. By progressively exposing additional areas previously masked, step cuts can be made with one mask application.

usually take this into account by forming a part so that the direction of the maximum strength of the material will be in the direction of the load. For example, when a designer is laying out a sheet metal bracket, he usually has it cut out of the sheet stock so that the grain runs in the direction of the load. Fortunately then, most parts that are to be chemically milled will have the same grain orientation. If this has not been done in order to obtain maximum strength, it must be done if the part is to be chemically milled properly.

Directional characteristics of the grain also affect the undercut. This variation is taken into account in the tooling so that again it is extremely important for all parts to have the same grain orientation in order to insure uniform results.

It is preferable that wherever possible the lands should run parallel to the grain for maximum strength. A rule of thumb that is used is that the width of a land should not be less that 0.10 inch and the distance between lands or unmilled material should be at least 0.125 inch greater than twice the depth of the cut for light cuts. This must be done to allow adequate circulation of the chemical solution.

Fillet radii are approximately equal to the total depth of the cut.

In the case of an area with cuts of different depths the fillet radii of each cut will be approximately equal to the depth of the cut as measured from the original surface. If a larger radius is desired than would normally be obtained, the milling is done on an oversized part. The entire part is reduced in size by milling. Radii will then be increased by the amount of the final reduction.

In an overall size reduction, all the radii are changed by the amount of reduction. The radii of convex surfaces are decreased and the radii of concave surfaces are increased. If the radius of curvature is important, then the change in radius caused by size reduction should be accounted for in the original design.

Deep cuts on both sides of a part should be avoided if possible if cost is a primary consideration. On a deep cut some of the gas generated by the chemical reaction is trapped in the undercut. This is undesirable because it slows down the milling process. The best way to put a part with a deep cut in the milling tank is with the deep cut facing up. If there is a deep cut on both sides, the part must either be placed in the vertical position or each of the cuts must be done separately. Placing the part in the vertical position is not as desirable as placing it face up

Manufacturers of

The heart of the appliance industry is mass production. Complicated items are produced within a price range that can be afforded by the average consumer because of the large number manufactured and sold. Projections into the future indicate that most appliances will become more complicated, particularly with the addition of many new electronic devices. Therefore, appliance manufacturers will be forced to turn to new production techniques if they are to mar-

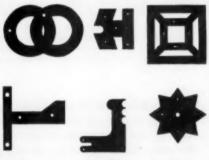


Figure 1

ket their products without increasing price.

Forming of thin metal parts is another application of chemical milling. Small linkages and levers, too complicated for stamping, are chemically milled out of thin metal sheet (Figure 1). The thickness of the parts is generally limited to .015 inch. Photographic, screen or offset printing techniques can be used to apply a maskant in the form of the part at USCM. This maskant then restricts the chemical action to the exposed areas. After masking, the metal sheets are placed into a chemical milling solution for a

Appliances Discover Chemical Milling

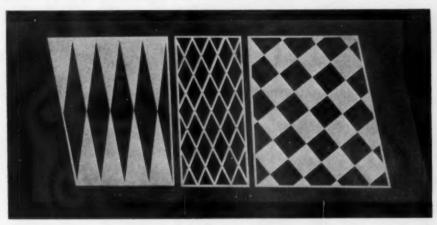


Figure 2

required length of time, and the parts are etched out of the sheet stock.

Attractive decorative finishes are also easily produced by chemically

milling a finished part. Very light cuts give a textured appearance (Figure 2), while deeper cuts give a three dimensional effect (Figure 3).

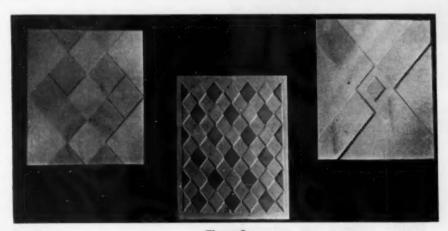


Figure 3

Long, complex shapes can be tapered relatively easy with the chemical milling process

because the gas is easily trapped at the upper edge of the cut. The cost is increased considerably by milling each side separately.



Ultrasonic inspection on parts made by USCM gives positive thickness readings of unparalleled accuracy.

Tapering is a very important operation that can be performed with chemical milling. Long complex shapes can be tapered relatively easy where such operations would have been impossible to perform with machine tools.

Waffle patterns are extremely

popular for sections with a high strength to weight ratio. When using this type of a section, the squares should be at least 2 inches on a side. The larger the waffle pattern, the easier it is to produce, and therefore less costly.

A section should not have two or more different taper angles in the same area adjoining in the same plane. The cost is increased considerably since two masking operations are required. In general, if a part has many different taper angles or many steps, the design should be carefully checked to see if it can be simplified.

Bosses, frequently used on cast parts, can cause trouble. These bosses produce a swirling motion of the chemical solution which tends to erode the surface. For example, consider a small rectangular piece with a boss on each of the two long sides of the rectangle. Part of the circular section of the boss projects into the rectangular area to be milled. During milling, boss projections are accentuated so that the milled area is more like a figure eight section than a rectangular section. This might be undesirable for some applications.

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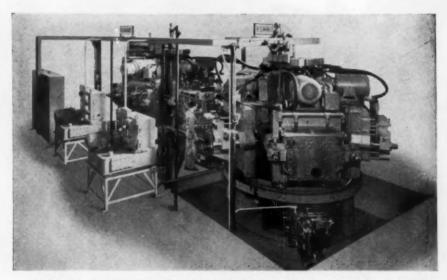


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ROCKFORD—Six new special machines, recently designed and built by W. F. and John Barnes Company, for processing heavy steel components for road building equipment, incorporate principles that can be economically adapted to low production work for smaller or larger workpieces.

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essing more than one part. By combining many operations in one machine there are important savings in both machining and work-handling time without overburdening or increasing the work load of the operator.

A company spokesman, speaking at a recent demonstration of the machines, estimated that the over-all design and



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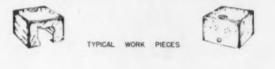
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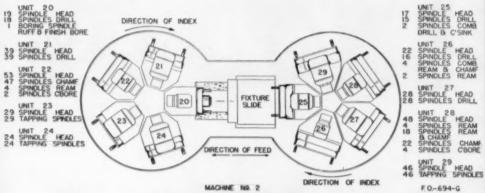
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operating advantages of the first four machines effects up to 50 percent reduction in equipment costs and up to 80 percent reduction in floor space.

The first machine is a special turret-

and it processes the three different welded steel cases. Each rotary table carries five multiple spindle heads with shuttle-type holding fixture between rotary table. (see illustrations)

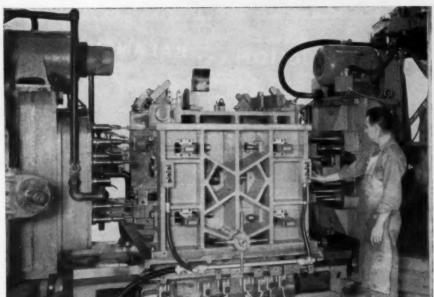




Schematic of head operations.

type drilling, reaming, chamfering, and tapping machine arranged with a 6station rotary table carrying six multiple spindle heads with shuttle-type holding fixture. This machine processes three different welded steel cases and three different top cover parts for each.

The second unit is a special turrettype drilling, reaming, chamfering and tapping machine arranged with two 5-station rotary tables, one at each end, The three welded steel cases and two gear covers that were processed on the first two machines have different surfaces machined on the third machine, a special turret-type drilling, boring, chamfering and tapping machine arranged with 6-station rotary table and carrying six multiple spindle heads. This machine is arranged with two shuttle-type holding fixtures, one on each side of the rotary table.



Shuttle type fixture saddle is equipped with locating blocks and clamps which locate and clamp special work holding pallets provided to suit each workpiece.

The two different gear covers started on Machine No. 3 are drilled, bored, chamfered and tapped on the fourth machine, which is arranged with a 4station rotary table carrying four multiple spindle heads with a shuttle-type holding fixture.

On the fifth machine, a special 5station, 2-way shuttle-type machine with vertical and horizontal heads, four different sizes of welded steel roller frames are processed. The parts mount in universal fixtures, Loading and unloading are combined at station No. 1.

Loading and unloading is likewise combined at station No. 1 on the sixth machine. This is a special 7-station, 2-way shuttle-type machine with horizontal heads for drilling, boring, chamfering and tapping two different steel frame parts, right-hand and left-hand.



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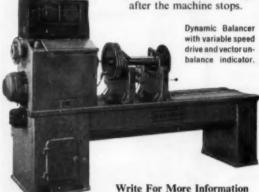
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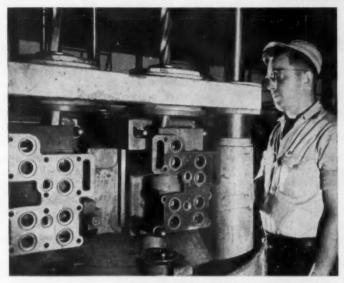
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Caterpillar Cuts Core Drilling Costs On Hydraulic Valve Body

JOLIET, ILL.—Tool engineers at Caterpillar Tractor Co. have reduced core drilling costs from .00124 cents per hole to .0008 cents on hydraulic valve bodies with Metcut pin-mount core drills which replace core drill holders and stub taper tips.

The workpiece is cast iron, and approximately 2¼ and 2¾ cu. in. of metal is removed when machined on a Barnes Special Boring Machine. Metcut tools are 1¾ in. diameter, tungsten

carbide tipped, and run at 210 rpm and 4 in. feed. Result is a saving of .0004 cents per hole.

The deep flutes with their chip capacity permit single-pass, straight-through drilling on deep holes. Sturdy pins provide accurate alignment and positive drive. Step-up time is minimized because the replaceable tips are easy to change and no readjustment of the machine spindle is required.

Sheffield Conducts Seminar on Machining and Gaging of Servos

Aircraft and missile personnel witness step-by-step process of making servos on manufacturing line set up in Dayton plant

DAYTON — The Sheffield Corporation was host to manufacturing and inspection personnel of the guided missile industry on March 27 and 28. The morning program included discussions on the principles involved in air gaging missile parts, gages used to check assembled ball bearings, in-process machine control gaging, the precision measurement services of the Eli Whitney Metrology Laboratory and a tour of the plant.

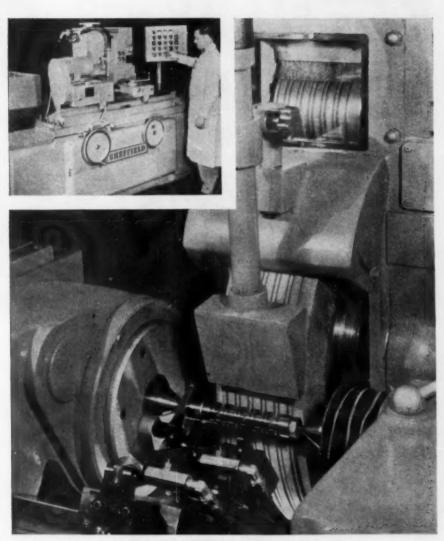
The afternoon program was devoted to observation of the machining and gaging of servos in Sheffield's newly completed machine tool building. A manufacturing line was set up to demonstrate the step-by-step process of making and inspecting hydraulic servo valves for use in aircraft and guided making and making and guided was servo to the step-by-step process.

The guests watching the operations saw how the piston lands and cylinder ports, which govern hydraulic flow and balance, must be individually matched to assure instantaneous actuation of controls. The Crushtrue Multi-Form Grinder No. 180 precision grinds the servo cylinder grooves and piston lands from the solid. A 1A Cylindrical

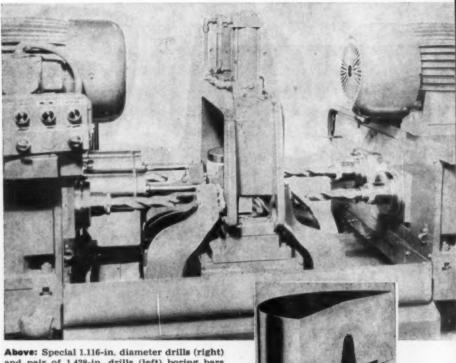
Grinder grinds the outside diameters of the piston and cylinder. Oil ports in the servo cylinder are rough cut on an electrical discharge unit and finish machined with ultrasonic energy on a Sheffield-Cavitron machine. A 121-C Micro-Form Grinder match grinds the piston lands to the cylinder ports. This grinder is also used to finish grind the piston lands after the flow test.

Lateral as well as diametral dimensions must be precisely controlled. A 5-column Precisionaire gage is used to check the relative position of the internal porting diameters in a cylinder and over-all length in a single operation. Automatic size control gages are used for in-process gaging of diametral size as well as lateral location. To indicate stock removal on the piston land, an Airetest Indicator is employed. Nondestructive testing of the hardness of finished servo pistons and cylinders is performed on the Micro-Hardness Tester. This instrument is capable of checking hardness of a land only .002in. wide.

Initially a number of these machines were specials. Today, they are standard items.



Crush grinding on Crushtrue 180 Grinder. The 11 grooves in the stainless steel servo cylinder were ground from the solid in one operation. The Precisionaire in-process gage device gages the part during grinding and automatically retracts the wheel at final size.



Above: Special 1.116-in, diameter drills (right) and pair of 1.428-in, drills (left) boring bars and indexing fixture of Style 17-A boring machine. Right: The 6½-in, O.D. aluminum alloy aircraft piston showing the stepped, semi-finished wrist pin hole, bored from the solid.

Wrist Pin Bores from the Solid

DETROIT—A recent set up on one of Ex-Cell-O Corporation's Style 17-A Precision Boring Machines has enabled a prominent aircraft manufacturer to drill and semifinish the wrist pin holes in a large aluminum alloy piston at a high rate of production.

These holes had to be machined from the solid, were required to be stepped and the piston itself was as large as $6\frac{1}{2}$ " O.D. Despite these adverse factors net production is running as high as 32 parts per hour.

Two pistons are loaded by hand and hydraulically clamped vertically downwards. The entirely automatic machine cycle commences with the table moving in rapid traverse to the right and feeding the components onto two 1.116" diameter drills to a depth of 1½". At the end of the stroke the table rapids to the left and feeds the components onto two 1.428" diameter drills for a total depth of 5\%". At the end of this stroke the table assumes its central position, whereupon the fixture is indexed towards the rear, aligning the pre-

viously drilled holes with a pair of boring bars. A table movement again to the left permits semifinish boring the two step diameters simultaneously on both pistons. After boring, the table returns to the center and the cycle is completed as the fixture automatically returns to its forward position.



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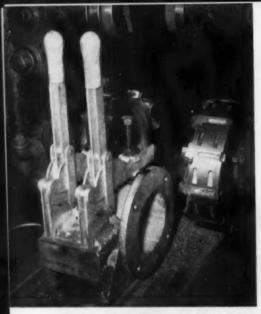
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Straddle Face Milling on Cast Iron Reduces Floor Time, Tool Costs

AUBURN. IND.—Straddle face milling cutters and work-holding fixtures used on an automatic mill to machine the 9-in, diameter faces of cast iron hopper base extensions, have reduced floor-tofloor time from 26 minutes by conventional facing on a turret lathe to 5 minutes, and have cut tool cost from 4.7 to 3.7 cents per casting. The change of machining method was made by Auburn Foundries, Inc., Heating Division, Auburn, Ind.

Carbide tooling was used in both types of machine operations: brazed tools (Style BL-10) for conventional facing and throw-away inserts for milling. Two "Odd Job" Face Kennamills, made by Kennametal, Inc., Latrobe, Pa., are used on a 48-inch Cincinnati automatic mill. Each of these cutters is equipped with 12 Style KSB-12 Kendex tools and Grade K6 square "turn-over" inserts.

Castings are now milled at 7 IPM 300 SFM, and 1/4-inch depth of cut. The Style BL-10 brazed tools did the job at .010 inch feed, 410 SFM, and 1/4-inch depth of cut. Another important factor in reducing floor-to-floor time is the quick-acting type clamping fixture which has been adapted to this operation by a special base that positions the casting for the milling operation.



Straddle face milling cut tool costs 21% under conventional facing on a turret lathe with brazed carbide tools.



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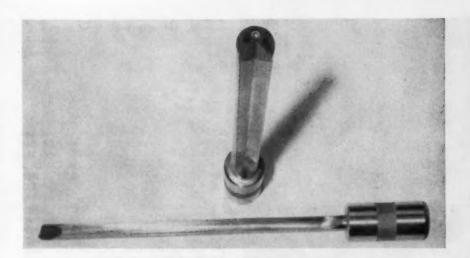


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Gun Drills Tested with Cemented Oxide Tips

DETROIT—Cemented oxide tips on gun drills were tested for the first time by Hyper Tool Company. The gun drills, .625 and 1 inch in diameter, are of the center cut design—they leave no core.

The cemented oxide was bolted to the steel shank as a safety factor because oxide is difficult to braze. A standard socket screw in a counterbored hole in the oxide holds the cutting tip in place. The Carboloy cemented oxide fits into a 60° included angle truncated "V" notch. This relatively small "V" angle was chosen to give longer sides to the "V" and a corresponding longer bearing surface upon which to distribute the cutting forces from the oxide to steel shank.

The drills are equipped with two oil holes, rather than one. The added flow of oil insures that chips will be rapidly removed from the cutting edge and prevent possible chip buildup and tip breakage.

The cemented oxide was pre-formed to shape. The center groove, oil holes and the hole for attaching bolt were formed in the piece when received by the customer. Hyper Tool Company then ground the cutting edge contour and finish-ground to tolerances. The cemented oxide was rough-ground with a 180-grit resinoid bonded diamond wheel and finish-ground with a 600-grit resinoid bonded diamond wheel. The tolerance on the cemented oxide diameter of the drill was held to within .000-.0002 inches.

This phase of the gun drill development program shows that it is economically possible to fabricate cemented oxide gun drills. The next phase will evaluate the performance of cemented oxides in comparison to conventional gun drill materials.

Field Reports

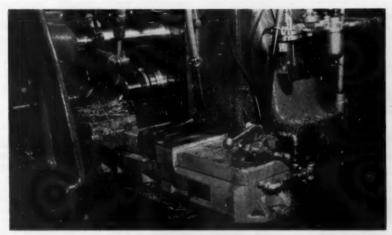
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Steel forgings are being machined 8 times faster than by previous methods on the LeBlond-Carlstedt Rapid Borer at the Peter J. Salmon Co., Glenside, Pa. In 5 fast operations, the new machine finish bores the steel part accurate to ± .001 on length and concentricity, 25 to 30 microinches on finish. Operation calls for solid boring %" diameter hole, counterboring 1" diameter, solid boring 1" hole and radius forming. Feeds of 5%" and 8" per minute are used. Part is 14%" long, 4130 steel Rockwell 39 to 43C. Formerly the part, an aircraft horizontal pin, had to be rough drilled, reamed, radius formed, ground and honed. Turret lathe, grinder and honing machine were used.



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Primary milling cut on rifle receiver ferging at Marlin Firearms Co., New Haven, Conn. Two Airlox Model S-7 air vises, products of Precision Devices Inc., with special 2-inch high jaw castings are mounted on a Brown & Sharpe B-12 horizontal milling machine. One vise can be unloaded and loaded while the work is being machined in the other vise.



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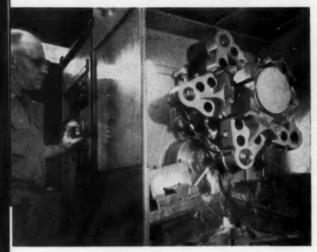
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High speed boring of air compressor stub shafts at Bedford Gear & Machine Company, Bedford, Ohio, is accompanied in a floor-to-floor time of less than 40 seconds per piece. Fabricated from an annealed 4140 forging, the workpiece must be bored to a depth of 1.16", holding a .004" accuracy on the 3" diameter cut. Bedford Gear meets these requirements in quantity production runs, using carbide tooling on a Warner & Swasey 2AC chucking automatic.

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Wardwell 35T Automatic Metal Saw Grinder Cuts Costs

Sharpens up to 115 saws .015 thick at one time. Includes slitting and screw slotting saws and milling cutters. Takes saws from 2" to



 $5\frac{1}{2}$ " diameter. Completely automatic. No attention is required after machine is started. Compact, sturdy 35T grinders are saving and making money for their owners all over the world.



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Contour Machining Wheel Shafts

CLEVELAND—Fast pace for a crawler is this high speed, contour machining of crawler tractor wheel shafts at The Oliver Corporation.

Of annealed 4150 bar stock, each workpiece is automatically rough and finish contour turned, tapered, chamfered and undercut complete in less than five minutes actual machining time. Two Monarch Mona-Matic lathes, equipped with air-gage tracers and hydraulically actuated front and rear tool slides, work facing each other on this job—one machining one end of the 16%" shaft, the second machining the opposite end.

Tooling consists of K-25 carbide insert and chamfering tools.

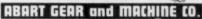


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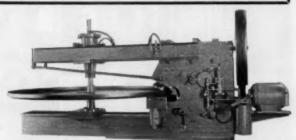


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- No. 5 ½" cap. Flanger for flat heads from 24" to 20". Also dished heads up to 12'.
- No. 6 %" cap. Flanger. Flat heads 24" to 20'. Dished heads up to 12'.
- No. 7 34" cap. Flanger. Flat heads 28" to 20". Dished heads up to 12" with knuckle radii up to 8".



Above machine a Ne. 4-%'' cap. with $\frac{1}{4}$ " head by 8' dia. shown. Machine for flat heads 20'' to 12'', For dished heads up to 12''. No. 49 $\frac{1}{4}$ " cap. Girele shear from 15'' to 12'3''. No. 69 $\frac{1}{4}$ " cap. Girele Shear from 15'' to 12'3''.

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This Rodgers Platen Press Draws

800 STEEL HOUSINGS A DAY

for Folev Power Mowers

Designing a light power mower to give heavy duty service and at the same time sell for an economy price takes a lot of engineering and production efficiency. The Foley TARTAN, with a cold-rolled steel housing formed on a Rodgers Platen Press, is the answer of Foley Manufacturing Co. to this problem.

The Rodgers 400-ton Platen Press handles three operations on the Foley lawn mower thousings. First, it blanks the flat stock to the proper 27½ x 28½ shape. Second, it makes the draw as shown in the photo. Third, it pierces all the holes and final trims ready for assembly.

A fast approach and return of the platen makes it possible to draw the 14 gauge coldrolled steel blank at a production rate of 100 an hour. Working at 190 tons pressure, the machine makes a smooth draw on a pneumatic die cushion. Accurate clamp-ing pressure over a 48" x 60" platen provides smooth, even forming and extra capacity when needed.

If you have an operation requiring a



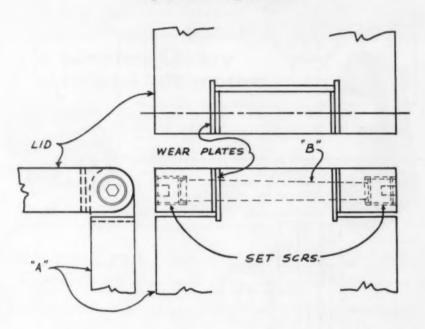
- 1 Redgers Platen Press turns out 100 Foley lawn mower housings per hour of 14 gauge cold-rolled steel.
- 2 This is the Foley TARTAN, an economy 1% HP rotary lawn mower with a heavy duty steel housing blanked, drawn and pierced on a Rodgers 400 ton platen press.

3 Both of the operator's hands are required on controls during the drawing operation—a safety factor.

Rodgers Hydraulic Inc.

7453 Walker St., Minneapelis 26, Minn.

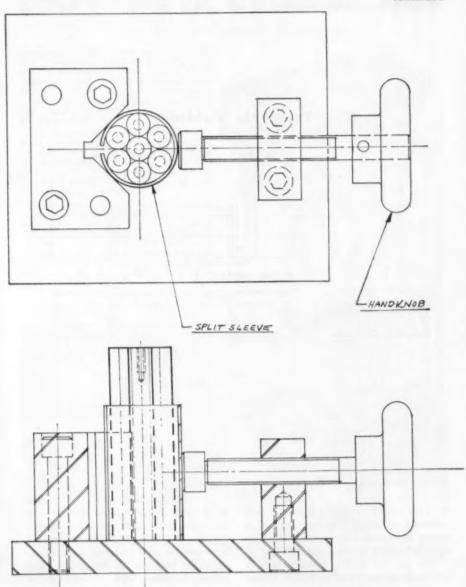
Taper Pin Tightener



By Cliff Bossmann

• This rather novel pin tightener was observed on a jig that consisted of a swing lid mounted on an upright member "A" with a tapered pin, "B".

The pin was held in position with a set screw on each end as shown. Upon investigating, I observed that when any looseness occurred in the lid the right set screw was moved out and the left set screw was tightened. This moved the pin to the right, eliminating the looseness; it also restored a more accurate fit between the lid and its supporting member, "A".



Tapping Fixture

By Roger Isetts

• Shown is a fast acting, simply constructed fixture for tapping small holes in rod ends. A vee block is screwed and doweled to a small base. A thin walled tube is split thru and placed

inside the vee block. The rods are placed inside the tube and clamped with a screw type handknob. The split tube acts much the same way as a screw machine collet.

After loading, the fixture is easily moved around with one hand under the tapping spindle.

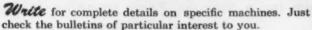
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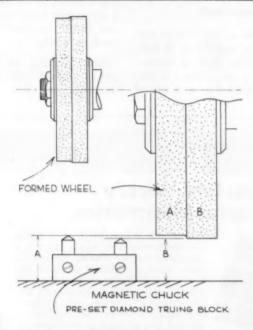
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AMERICAN CHAIN & CABLE 230-T Park Avenue, New York 17, N.Y.



Truing Block for a Stepped Form Grinding Wheel

By H. J. Gerber

• In our shop we have used the illustrated method for diamond truing a simple step form on the periphery of a grinding wheel used on the surface grinder. For a production job requiring frequent re-truing to a precision step height the method will be a great time saver.

Two truing diamonds are mounted in a small steel block, as shown. They are spaced apart a slightly greater distance than the total width of the wheel in order that only one diamond is in contact at one time. Difference in height between the two diamonds governs the step height on the wheel and this distance can easily be set by micrometer measurement between each diamond and the bottom of the block before the block is set up on the magnetic chuck.

The leading diamond (B) is run completely across the face of the wheel. At the first sign of contact between the wheel and the second diamond (A) a reading is taken on the micrometer dial of the cross feed. This second diamond is then fed inward by cross feed the required amount for proper width of the step.

When a wheel is to be trued many times during the course of a day's work the time spent to make up this simple device will be amply repaid.

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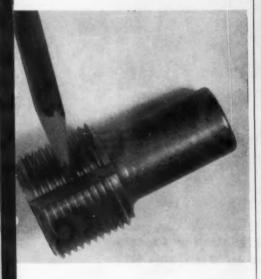
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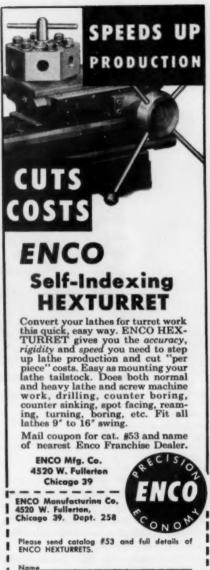
Slot in Thread Plug Gage Catches Dirt and Chips



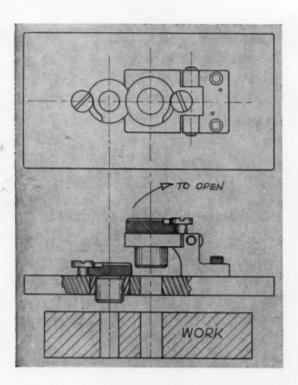
By H. J. Gerber

 A longitudinal slot ground across the threads of a plug gage will to a great extent permit a gage to be self cleaning as it is being used.

While the gaging of a dirty piece of work is not condoned there may often be chips or dirt which is overlooked and which could easily prevent a true gaging unless it were caught and trapped in this groove.



Firm.



Auxiliary Bushing Plate for Closely Spaced Holes in Drill Jig

By H. J. Gerber

• Often in designing a jig it is found that hole spacing in the work piece is too close to permit installation of liners and slip bushings adjacent to each other without interference.

One remedy for this involves the making of a special hardened two hole bushing. This practice is, however, very expensive. In our shop we have made use of the illustrated auxiliary bushing

plate which has worked well in a situation of this kind.

One bushing is located in the main jig plate, as is usual. The second bushing is then supported over an opening in the jig plate by a raised bracket and hinged leaf. This leaf may even partially cover the first bushing location after this first hole is machined with the leaf raised. The leaf is then lowered and the second location is drilled. It is then flipped up vertically to permit machining the No. 1 hole in the next work piece.



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(See Number 2)



(See Number 3)

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- 2. Horizontal Milling, Drilling and Boring Machine. The Model 3 is a rugged machine with drives and feeds arranged to deliver exceptional power to the spindle and stepless (infinitely variable) feed operation for head, table, saddle and spindle, giving a full range of feed in each spindle speed. The head is equipped with a 3" spindle. Contained in the head is an efficient gear train incorporating silent gears and directly driven by a precision balanced 7½ hp 1750 rpm motor. Brochure available from The Portage Machine Co., 1025 Sweitzer Ave., Akron 11, Ohio.
- 3. Milling Machines. The heads, columns, and tables on C-Model Rigidmils are self-contained units, permitting interchangeability through several sizes. As described in brochure, they are available in combinations from 7½ to 75 hp, 14" to 38" table width, and 3' to 14' feed stroke. Sundstrand Machine Tool Co., Rockford, Ill.
- 4. Self-Locking Socket Screws. Literature describes the Microsize Unbrako socket head cap and set screws with Nylok self-locking feature, which increases the gripping power of the tiny fasteners. Design and processing features result in an increase in strength of 80% for these fasteners. Standard Pressed Steel Co., Box 606, Jenkintown, Pa.
- 5. Drum Lifts. Leaflet describes how one man can lift and rotate the drum to pour, and easily stack and transport it. Girdles and pouring spouts for the drums are listed also. Sterling, Fleischman Co., Broomall, Pa.
- 6. Flat Surface Disc Grinders, Abrasive Discs. Bulletin CG-58 illustrates the basic types of disc grinders, work carrying fixtures, variety of shapes and sizes of workpieces ground, and the range of sizes and types of faces of abrasive discs. Gardner Machine Co., Beloit, Wis.
- 7. Control Devices. Selection charts covering starters through 200 hp provide quick selection of proper starter, heater and pushbutton station for any type of enclosure. Illustrated Catalog GEC-1260C has guide form specs, for accurate designation of controls. Included also are the new "100 Line" manual and magnetic motor starters. General Electric, Schenectady 5, N.Y.

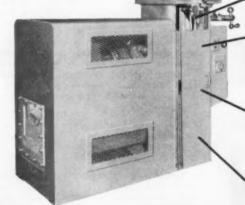
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- 8. Prejecting Microscope. The Swiss precision Projectina features direct optical comparison, which means to compare simultaneously any two objects, side by side. Magnification is 7x to 2000x. Pamphlet describes instrument as used in the metallurgical, metal, instrument, watch, and medical industry. Hofmann & Co., 631 59th St., West New York, N.J.
- 9. Special Machines and Fabrication. As folder explains, a new division is geared to handle problems from analysis to completed construction. Pictured are special machines in production. Automation equipment may be assembled in whole or part, and arc weld fabrications can be handled up to 30 tons. Special Machine & Fabrication Div., Composite Forgings, Inc., 1469 E. Atwater St., Detroit 7, Mich.
- 10. Teoling With Throw-Away Inserts. Catalog No. B-305 includes 42 styles and 220 different holders for tools with throwaway carbide inserts. They include negative and positive rake tools, roller turner tools, boring bars, etc. Kennametal, Inc., Latrobe, Pa.
- 11. Precision Metai Finishing. A 24-page catalog on precision metal finishing by mechanical barrel-finishing methods is now available. The story of how roto-finishing is applied to the grinding, de-

- burring, descaling, and coloring of metal parts contains special information for process engineers. Illustrations and descriptions of the equipment by model number, basic machine dimensions, and recommended work loads are included. Roto-Finish Co., Kalamazoo, Mich.
- 12. Gages. Good gaging practices, involving plain and thread plug and ring gages, are described in 16-page booklet. Work tolerances, gage tolerances, wear allowances, and gage pricing are subjects covered. Rite-O Tool & Gage Co., 321 W. Ten Mile Rd., Hazel Park, Mich.
- 13. Instruments for Precision Temperature Measurements. Booklet includes descriptive and technical data on the Pyro optical, micro-optical, radiation, immersion, surface and indicating pyrometers. The Pyrometer Instrument Co., Inc., Bergenfield, N.J.
- 14. V-Beit. A new Condor LS V-belt made for long center, heavy duty drives is featured in Bulletin M210. It has precision proportioned construction reported to eliminate V-belt whip and turn-over that leads to belt failure. Raybestos-Manhattan, Inc., Passaic, N.J.
- 15. Fixturing Devices. Listed in small booklet are ball handles, clamping handles and levers, hand knobs, spring assortments, clamps, vises, etc. They are illustrated and described with specs. and prices. Reid Tool Supply Co., 332 W. Delano Ave., Muskegon Heights, Mich.



(See Number 10)



(See Number 11)



(See Number 12)

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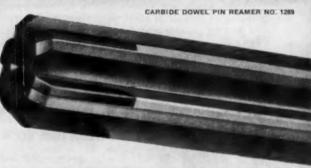
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Free Literature

continued

- 16. "This is Metal Carbides" presents facilities and manufacturing processes of a producer of tungsten carbide products by both the hot and cold press method. A pictorial plant tour is given. Metal Carbides Corp., Youngstown, Ohio.
- 17. Precision Expanding Mandrels are defined in new folder, which presents a description of each type of mandrel, straight jaw, step jaw and miniature, along with the range of sizes. Le Count Tool Works, Inc., 38 Cody St., W. Hartford, Conn.
- 18. The Most Efficient Electrode for any welding job is the subject of 12-page Weldirectory." To help select the best electrode for overhead, downhand, sheet metal or other work, basic characteristics of each family of electrodes are described. The Lincoln Electric Co., Cleveland 17, Ohio.
- 19. Double Geared Presses. The MS2, two point, straight side presses, cap. from 150 to 500 tons, feature the intermediate shaft combination air friction clutch and brake drive arrangement which makes for high single stroke efficiency. Bulletin from The Minster Machine Co., Minster, Ohio.
- 20. Precision Mechanical Finishing Equipment and the processing media and compounds to be used are described in cata-

- log. The Mechamatic machines are designed for production finishing of parts too large or delicate for other finishing methods. Mecha-Finish Corp., South St., Sturgis, Mich.
- 21. Lathes. Bulletin No. 1506 describes the Series 62 preselector Dyna-Shift lathe. The headstock, in addition to allowing required operating speeds to be preset, provides automatic spindle speed calculation, a wide 36-speed range—17 to 1750 rpm, and finger tip hydraulic shifting. The Monarch Machine Tool Co., Sidney, Ohio.
- 22. Adhesives, Coatings and Sealers for improving commercial trailer and mobile home production efficiency by sealing lap seam joints, bonding rubber to metal, and other ways, are described in catalog. Minnesota Mining & Mfg. Co., 423 Piquette Ave., Detroit 2, Mich.
- 23. Multi-Purpose Valves. Bulletin pictures and describes 8 models of the 3-way quick-dump valve. The two-in-one valve installs either normally open or normally closed. Cycling speeds of 30,000 per hour can be obtained. Humphrey Products Div., General Gas Light Co., Kalamazoo, Mich.
- 24. Power Presses. Brochure includes complete tabled specs. as given on 34 models available, including inclinable, straight side, gap and horn presses. Johnson Machine & Press Corp., 620 West Indiana Ave., Elkhart, Ind.



(See Number 19



(See Number 20)



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1001

continued

25. Bering Machine. Leaflet describes a precision boring machine as performing turning, boring, and facing operations accurately and speedily. The machine is reported ideal for long and short runs, easy to set up, and spindle runout is less than .00020". It has single or double spindle, pushbutton cycling, manual or automatic. Jones & Lamson Machine Co., Springfield, Vt.

26. Coil Stock Handling Equipment is pictured and featured in catalog. Included are roll feeds, feeding and straightening machines, rack and pinion feeding machines, coil cradles up to 30,000 lb. cap. F. J. Littell Machine Co., 4101 N. Ravenswood Ave., Chicago 13, Ill.

27. Jig and Fixture Components, and clamp assemblies are diagrammed with tabled specs. in Catalog No. 12. Grouped for convenience are components necessary to standardize tool engineering practice. Lodding, Inc., Worcester, Mass.

28. Precision Ground Flat Tool Steel is the subject of leaflet. OILcrat (SAE-01) is an electric furnace tool steel. AIRcrat (SAE-A2) is an electric furnace air hardening tool steel. Marshall.Crat (low carbon) is 1018 steel of forging quality purchased to high standard specs. Marshall Steel Co., Box 108, La Grange, III.

29. "Thread Tips" discusses hardened-andground heads, as well as heat-treated heads. Featured particularly is the 77TA automatic coupling tapping machine designed for high production precision tapping of oil tubular goods and commercial couplings ranging from 3½" non-upset tubing to 8½" casing. Landis Machine Co., Waynesboro, Pa.

30. "Industrial Gas Equipment" is the title of catalog No. 1570 on Buzzer industrial gas burners, furnaces, and accessories for heat treating and metal melting. Based on the Venturi air mixer design, the gas furnaces and burners are reported to provide quick heat-up without requiring compressed air, blower or other power. Temperature curve and work rate charts also included. Charles A. Hones, Inc., 2463 Grand Ave., Baldwin, L.I., N.Y.

31. Air Gage Members. A 20-page manualtype brochure describes air gage members. Air gaging as a dimension measuring science is treated in the introductory section. The three major types of air gage circuits are discussed in the following sections, each presenting a detailed schematic diagram. Freeland Gauge Co., 9940 Freeland Ave., Detroit 27, Mich.

32. "Since 1838 . . . Serving Industry, Associations, libraries, schools, reference, research," is the title of folder presenting the Hitchcock publications. For industry in general, but particularly the woodworking, metalworking, and public passenger



(See Number 29)



(See Number 30)



(See Number 31)

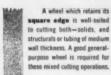
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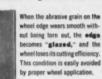




ABNORMAL . The wrong wheel, or improper application, produces edges like these:







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Cutting speeds of a few seconds per square inch, on almost any material, mean substantial time savings. Even titanium can be cut quickly and economically with the right abrasive cutting machine and wheel.

Fine finish obtained from abrasive cutting avoids burn, minimizes burr, and reduces or eliminates additional finishing operations.

Accuracy of CAMPBELL machines permits cutting within the closest tolerances, reduces rejects and scrap loss.

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... biliets up to 12" square ... plate up to 6" thick and 20 ft. long. ALLISON wheels—more than 150 different specifications—rubber or resinoid bond —3" to 34" diameters—.006" to 3/16" thick.

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ALLISON-CAMPBELL Division has a modern, fully equipped Demonstration Laboratory in which your own cutting problems can be analyzed. Write for a copy of DH-20, a new bulletin describing these services. Details on ALLISON Abrasive Cutting Wheels and CAMPBELL Machines are also available.

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Ad No. 1042-A



continued

transportation fields. Subscription rates are given. Technical books, booklets, and reprints also are listed. Hitchcock Publishing Co., 222 E. Willow, Wheaton, Ill.

- 33. Steel Shelving and Steel Shop Boxes are among the products listed in 24-page catalog. The bin-type units are for display and storage of bulk and packaged items. Shelf boxes and drawers, stacking boxes, service and stock carts are described. Bay Products Inc., 1835 W. Cambria St., Phila. 32, Pa.
- 34. Tape Control System. The system, for controlling the production of machined parts, is described and shown diagrammatically with photographs and line drawings from the numerical drawing stage to the control tape and the machine tool control unit. How a typical machine can be modified for the system is also discussed in brochure. Bendix Aviation Corp., 21820 Wyoming Ave., Oak Park, Mich.
- 35. Taps. The Besly X-Press taps form internal threads without cutting in copper, brass, zinc, aluminum, leaded steels and other ductile metals, according to bulletin. Case histories, specs, and styles for correct application included also. Besly-Welles Corp., South Beloit, Ill.
- 36. Furnaces and Ovens. Brochure decribes seven new products now obtainable.

These include the lab-size Stabil-Therm mechanical recirculating utility ovens, 800°F ultratemp mechanical convection ovens with improved electronic control instrumentation, and Rad-O-Glow lab-size Globar furnaces (2800°F). Blue M Electric Co., Blue Island, Ill.

- 37. Cutting Tools. Catalog No. 12 describes carbide rotary cutters which feature specially designed fluting for individual applications. Bore reamers eliminate problems such as snaky holes, poor finishes. Die-sinking and key way cutters, twist and spade drills, are among the items discussed. Dixie Tool Industries, Inc., Bridgeport, Mich.
- 38. Air Chucks. Catalog lists and prices the manufacturer's complete line of air operated chucks, cylinders, and accessory equipment. The Cushman Chuck Co., Hartford 2, Conn.
- 39. Milling Machines. Rigid automatic Hydrocopy milling machines, Models KA-100, KA-200, and KA-250, are discussed in brochure. Some features are: fully automatic cutting operation; normal working accuracy of ±.002" or even closer. Cosa Corp., 405 Lexington Ave., N.Y. 17, N.Y.
- 40. Toolmaking Machine, Brochure with line drawings covers applications in extrusion dies, tungsten carbides, and other tools and dies of the Williams Roto Recipro Toolmaking machine. Connecticut Tool & Eng. Co., Round Hill Rd., Fairfield, Conn.



(See Number 37)



(See Number 38)



(See Number 39)



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continued

- 41. Lathes. 32-page bulletin describes Betts heavy-duty geared head lathes, available in sizes from 48" to 144". Included are specs. for each lathe size. Consolidated Machine Tool Div., Farrel-Birmingham Co., Inc., 565 Blossom Rd., Rochester 10, N.Y.
- 42. Shop-Blocks gage blocks described in catalog sheet are accurate to within +.000006" -.000002" of nominal sizes, permitting use as working gages. Specs., set sizes, accessories available, and prices are given. DoAll Co., Des Plaines, Ill.
- 43. Collet Chucks. Flyer describes the Micro collet chuck designed for absolute concentricity when using small tools. Once alignment is made, it is not necessary to re-align the chucks when new drills are used. Detroit Cam & Tool Co., 2305 Goodrich Ave., Ferndale 20, Mich.
- 44. Roller-Drive Floating Tool Holders, for tapping, counterboring, reaming and threading, are described in literature. The tool holders come in various shanks. Specs. and prices included in booklet. W. M. Ziegler Tool Co., 13570 Auburn Ave., Detroit 23, Mich.
- 45. Diamond Traps. Folder defines Model 1-B as designed to by-pass aluminum oxide and silicon carbide to central system. It

- is used on machines that do a variety of grinding operations. Model 2-B is used on machines where diamond wheels are used exclusively. Air scoops are also pictured. American Industrial Diamonds, Inc., 6851 Chase Rd., Dearborn, Mich.
- 46. Metalworking's Tremendeus Gains in the South is the subject of brochure on survey covering 23 southern states having 1,127,814 metalworking employees. The American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.
- 47. "Coated Abrasives for All Industry" is the title of booklet on how to order Armour coated abrasive products. Paper and cloth sheets, paper and cloth rolls, paper and cloth belts, and paper and cloth discs are some of the items listed in tabled form. Armour Coated Abrasives Div., Armour and Co., Alliance, Ohio.
- 48. Chucking Machine. The 95 single spindle automatic chucking machine features increased speed range, simplified electrics, extra turret face, and great total turret stroke. Brochure includes also a capacity chart on this English-make machine. Ferdinand J. Snow Co., 331 Old Hook Rd., Westwood, N.J.

Literature described on these pages may be obtained by encircling the corresponding number on "Free Literature" cards opposite page 64 and page 288.



(See Number 49)



(See Number 50)



(See Number 51)

NOW...cut thousands of fine-pitch threads without breaking taps!



PROLONGS TAP LIFE—Gives you reliable release... precise control over torque. Releases instantly and completely below break strength of the tap. Preset torque release remains constant because sliding friction and heat are eliminated.

REDUCES MAINTENANCE—All contacting driving members roll on each other... eliminating heat and wear. Gear-type reversing mechanism requires no adjustment... produces little or no heat and is under load only when reversing.

INCREASES PRODUCTION—Operators gain confidence and step up machine speeds because there's no noise, vibration, or impacting. There's no slowdown for blind holes, no downtime for repairs.

PRODUCES BETTER THREADS—There's no thread distortion due to impacting or

vibration. Driver starts releasing when taps get dull, preventing production of undersized threads. Tension spring permits tap to float in and out of hole... follows own lead without distorting threads.

ASK FOR FREE DEMONSTRATION—Your Scully-Jones representative or distributor has a sample reversible "Safe-Torque" tap driver with him to demonstrate on your "problem" jobs. Call him or write us: Scully-Jones and Company, 1907 S. Rockwell Street, Chicago 8, Illinois. For more information, ask for new supplement to Bulletin No. 20-50.



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Hundreds of installations over the past few years have proved the economy of the only hardness tester which combines all scales of Rockwell Test (15 to 150 kg. loads).

The Kentrall cuts costs because it does the job of two conventional testers, requires only half the space and maintenance. Write for more detailed information, plus a list of prominent users who have switched to Kentrall.

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Free Literature

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49. Dial Indicators. Good quality of materials used, rigid inspection, and skilled assembly combine to produce indicators smooth in action, accurate and long lasting, according to folder available from Sema Corp., Boston 72.

50. Vapor Cooling Generator. The Coolie Toolie, as described in folder, offers a one-gallon polyethylene tank with visibility of coolant supply. Vapor is controlled at all times, and self-cleaning nozzle never clogs. Coolie-Toolie Div., P.O. Box 1, Riverdale Station, Dayton 4, Ohio.

51. Sketchforming Set. For drawings of parts to be produced, a sketch is made on the set and is reproduced in triplicate, leaving a copy for the customer and copies to send to the Teiner engineers. The firm does fabrications which combine spinnings, welding and machine components. They do precision machining and have facilities for on-premise tooling work. Roland Teiner Co., Inc., 134 Tremont St., Everett 49, Mass.

52. Pliable Way-Protection that opens to 90' on both sides of a tool column and closes to a minimum of 24" is illustrated in Bulletin GW-100. Gortite protection is used on milling and boring machines, boring bars, lathes, etc. A & A Mfg. Co., 712 S. 12th St., Milwaukee 4.

53. Colorful Plastic Slide-Rule Type Selector enables engineers and draftsmen to requisition Acme or A.S.A. standard bushings without referring to a catalog. It gives standard sizes for over 30,000 drill bushings and will designate o.d. and i.d. of liners in decimals. Available free from Acme Industrial Co., 200-222 N. Laflin St., Chicago 7. Ill.

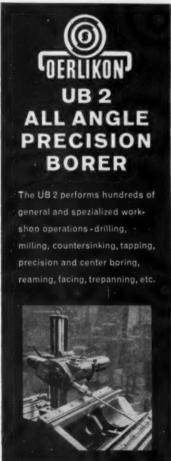
54. Carbide Insert Holders for Triangular Inserts. The speed and economy of carbide throwaway inserts can be combined with the rigidity and efficiency of quick change tool posts. No. 12 is for righthand turning, No. 14 for left-hand turning, and No. 16 combines both, as described in flyer. Guide stop which speeds multiple

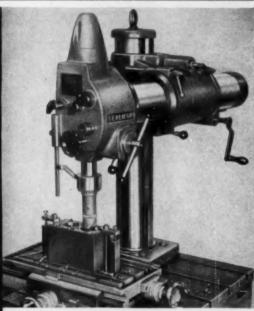
piece operations and all purpose tool tray are also presented. Aloris Tool Co., Inc., 419 Getty Ave., Clifton, N.J.

55. "Special Cams" is the title of booklet which describes in detail, with pictures, cam millers, cam grinders, turret lathes, visual comparators, and air gages. Included also are some of the specially designed cams for the aircraft, guided missile, and electronics industries. The American Cam Co., Inc., P.O. Box 2106, Hartford, Conn.

56. Pneumatic Tools are high-speed tools for contour finishing and grinding of dies. They are compact and lightweight. The Dotco tools are positive starting, run cool and vibration-free at higher speeds, as related in leaflet. Doeden Tool Corp., Sherwood, Ohio.

57. Vises. An informative folder shows how to save time and money with a master multi-swivel vise for instant setting of compound angles. Donovan Mfg. Co., 80 Batterymarch St., Boston 10, Mass.



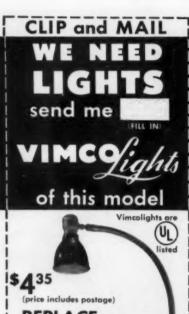


- Radial swivelling arm and a freely swivelling head allow handling of any job, even in awkward positions.
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- · Spindle speeds variable from 30 to 3070 rpm.
- Accessories include precision chuck, tapping heads, collets holder, adjustable boring head, facing and turning head, trepanning tool, boring bars, etc.
- · Portable take it right to the job.

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Free Literature

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58. "Photodrawing" is the title of a booklet showing the use of photographs to convey engineering drawing information in an easy-to-visualize form. Two different methods of preparing photodrawings for use in industry are discussed. Sales Service Div., Eastman Kodak Co., Rochester, N.Y.

59. Deburring Tool. A miniaturized airpowered tool for deburring, drilling, grinding and polishing rotates at speeds up to 150,000 rpm. As described in folder available, the AirBurr is ideal for tool, die and mould finishing, instrument making, and other hand operations. It can be used in %" openings. Ellison Engineering Co., 4530 San Fernando Rd., Glendale 4, Calif.

60. Cutting Tools. Catalog No. 17 lists in tabled form prices and specs. of milling cutters, slitting saws, end mills, drills and reamers. Special side milling cutters range from 3" dia. to 12", single and double angle cutters are available from stock 2\%" dia. to 6" dia., and from \%" wide to 1\%" wide. F & D Tool Co., Inc., Three Rivers, Mass.

61. Milling Machines, Band Saws, Power Presses, arbor presses, drill presses, and squaring shears are among the large line of machine tools discussed in recent 12-page catalog. Famco Machine Co., 3100 Sheridan Rd., Kenosha, Wis.

62. Aluminum. Chart Sec. G, No. 1 covers both government aluminum specifications and information on the bending and forming of aluminum sheet and plate. On durable cardboard stock, it is regular file card size. Peter A. Frasse & Co., Inc., 17 Grand St., N. Y. 13, N.Y.

63. How to Adjust Double-Enveloping Worm Gears accurately with no more than a set of feeler gages, or a dial indicator, is the subject of Bulletin CD-575. Cone-Drive Gears, Div. Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.

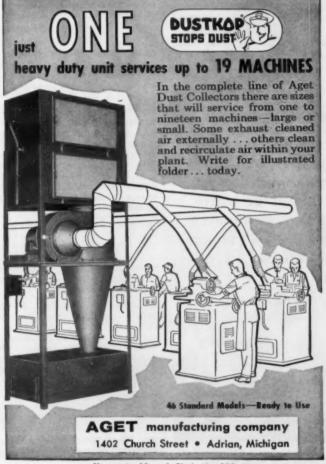
64. Micrometers. Recent bulletin includes information on standard micrometers.

data on large micrometers regarding maximum sizes, and measuring range in the various sizes. J. T. Slocomb Co., Glaston-bury, Conn.

65. Hydraulic Lift Tables. An 8-page booklet describes how problems of lifting, feeding, and work positioning may be simplified. Information and specs. of the firm's four basic series of lift tables are given. Southworth Machine Co., Portland, Me.

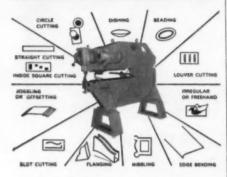
66. Tapping Compound. Rapid Tap in 4 oz. cans is reported to save tools by eliminating breakage, reducing the number of rejected parts, and also reducing tool wear. Termite Drills, Inc., Pasadena, Calif.

67. Chemical Milling is the subject of a 10-page brochure. Topics include: "What is Chemical Milling; What Are Its Advantages; Metals That Can Be Chemically Milled." U.S. Chemical Milling Corp., Manhattan Beach, Calif.



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- 68. Cutting Oil. Bulletin 16 describes the Sunoco emulsifying cutting oil, its characteristics and advantages. It is said to give higher machining efficiency and to be a purer, cleaner oil. Sun Oil Co., Phila, 3.
- 69. Tool Services. The firm offers immediate delivery from a stock of standard cutting tools. Special tools can be made to the customer's requirements, and experienced tool engineers help solve cutting tool problems. Folder available from Rutland Tool Service, 1617 E. McNichols, Detroit 3. Mich.
- 70. Hot Rolled Steels. Bulletin 11-2 is a guide to hot rolled steel bars, structurals. plates, sheets and strip. Cutting services are illustrated and described. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80. III.
- 71. Pneumatic Comparator Gages. Bulletin 8007 features a pneumatic plug which brings new economics to air-gaging; a master which provides "two-master" accuracy in one ring; a building block approach to automation, and high rangeability (to 0.350") in gaging cartridges. Moore Products Co., H & Lycoming Sts., Philadelphia 24, Pa.
- 72. "Master Manual of Cutting Tools" presents each type of Morse tool. Every copy will be registered to prevent duplication of circulation, and to make sure the registered ones receive supplementary material. Morse Twist Drill & Machine Co., New Bedford, Mass.
- 73. Materials Handling Equipment. 60 pages of illustrations and descriptions concern products such as vibrators, packers and jolters, car rappers, hopper level switches, flow control valves, power tools, and concrete finishing equipment. Syntron Co., 300 Lexington Ave., Homer City, Pa.
- 74. High Alumina Ceramics are colorfully described in convenient file folder. It contains complete information on the physical properties and characteristics of Diamonite. Diamonite Products Mfg. Co., 1232 Cleveland Ave., N.W., Canton 3, Ohio.

Southwestern Metal Show At Dallas May 12-16

The American Society for Metals' first Southwestern Metal Exposition and Congress will be held May 12 through 16 at Dallas, Texas. Emphasis is on aircraft materials, fabrication techniques, high temperature steels and alloys, and metals problems in the petroleum and chemical industries.

There are 29 scientific presentations scheduled, including a major paper sponsored by Texas chapters of the Metal Treating Institute. In addition, the Society for Non-Destructive Testing is presenting a four-day technical program and local and regional chapters

of national engineering societies are being invited to participate in both. The 250 exhibitors in the Show will present displays of particular interest to the Southwest and South.

Southwestern Congress sessions in the mornings will be in the Statler Hilton Hotel. Afternoon meetings will be in the Texas Hall of State at the State Fairgrounds in Dallas. Exposition site will be the Automobile Building in the Fairgrounds. Several plant tours are being arranged in connection with the Exposition and Congress.



Site of afternoon technical sessions at the first Southwestern Metal Exposition and Congress will be the Texas Hall of State building at the State Fairgrounds, Dallas.



New Divisions for B & S

Formation of two new divisions, the Cutting Tool and the Hydraulics, has been announced by the Brown & Sharpe Mfg. Co., Providence, R.I.

The Hydraulics division, to be headed by Herbert H. Upton, general manager, combines three previously independent business activities: Brown & Sharpe's former Hydraulic Products division. located in Providence, R.I.; the Double A Products Co., located in Manchester. Mich; the power unit portion of the Rosaen Co., of Hazel Park, Mich.

The Cutting Tool division, Thomas Hollis, Jr., general manager, will combine the design, manufacture and sale of both high-speed steel and tungsten carbide cutting tools, B&S will continue to manufacture high speed steel cutting tools at their plant at Greystone, R.I., and tungsten carbide cutting tools at the Nelco Tool Co. plant in Manchester, Conn.



Herbert H. Upton



Thomas Hollis, Jr.

Portable Tool **Division Moves**

The Onsrud Machine Works, Inc., has announced the relocation of its Portable Tool Division from Chicago to a suburban industrial area immediately north of the city. The new address is 7720 Lehigh Ave., Niles 31, Ill. This location provides space for enlarged engineering and manufacturing facilities.

Open House at Portage

The Portage Machine Co. was host at a well-attended Open House Friday evening, March 21, at its plant located at 1025 Sweitzer Ave., Akron, O.

The plant tour included showing of the company's products. Among the special attractions was a new 3" diameter bar horizontal milling, drilling and boring machine.

Visitors were also much interested in the new P.D.Q. layout machine, claimed to offer savings of as much as 2/3 of the user's casting layout time.

LeCount Builds New Plant

LeCount Tool Works, Inc., West Hartford, Conn., has recently moved into its own new building offering improved facilities. The world's oldest mandrel manufacturer, LeCount patented the first expanding mandrel for the metalworking industry in 1847, a type which is still in use today.

AMTDA Initiates Name Plate Program

Member companies of the American Machine Tool Distributors' Association have arranged for a simple name plate to be placed upon every new "American made" machine tool that they sell, a symbol which will say, "This machine was made in America and sold by a member of the American Machine Tool Distributors' Association."

The name plates are available to members through the Association's Philadelphia office at 20 cents each. They are packaged in lots of 50, which is the minimum quantity in which they can be purchased.

New Company Reconditions Old Taps

The newly formed Pioneer Tool Crib, Inc., of Farmingdale, N.Y., is engaged in the reconditioning of taps. The com-





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pany staff is headed by Frank Cinelli, a former production manager of S. W. Card Mfg. Co.

The service includes removal of worn, loaded or damaged threads, refinishing of straight flutes to obtain clean cutting faces and to improve the surface finish, grinding of precision chamfer with uniform height of cutting edges and proper amount of relief.

Spiral points are ground in special flute grinding machines to obtain precise control of index and hook. Straight flutes can also be ground in the same manner.

Pivot Punch Division Moves into Larger Plant

Upon expansion of the buildings which house the Pivot Punch and Die Corporation's Special Tooling Division, the Punch Division has moved to new and larger facilities. All operations are now consolidated at one location, 1254 Erie Ave., North Tonawanda, N.Y.

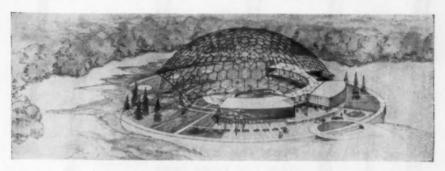
Methods Improvement Contest

The Industrial Management Society has announced it is now accepting entries for its eighth annual methods improvement contest to be held in conjunction with its 22nd annual Industrial Engineering and Management Clinic, November 5-6-7, 1958 at the Hotel Sherman, Chicago.

Industrial plants and companies as well as student groups in colleges and universities studying industrial engineering are invited to submit entries in the Competition. The Society will award first, second and third place trophies in five classifications to winning schools and companies for 16 mm films describing "before and after" phases of methods improvements and industrial engineering training projects. Persons participating in the award-winning films will receive individual certificates of merit.

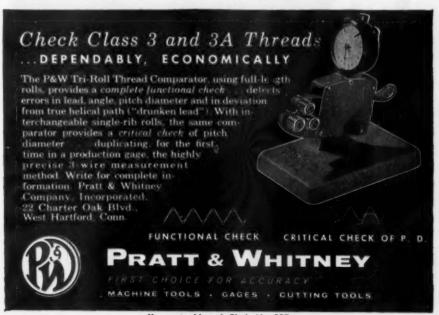
Rules and regulations for the 1958

Methods Improvement Competition may be obtained by writing to the Industrial Management Society, 330 South Wells Street, Chicago 6, Ill.



NEW HEADQUARTERS BUILDING designed for the American Society for Metals. It features an aluminum geodesic dome, or "space lattice" (250' x 103'); a semi-circular concrete and steel building in three levels, and a 400 ft.

dia. garden piazza. A \$2,000,000 project, the new structure will be located east of Cleveland on a 100-acre rural site. A great variety of metals will go into its construction.





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MACHINE and TOOL BLUE BOOK



ASTE Tool Show Exhibits - Part 2

Products described below will be exhibited at the ASTE Tool Show in Philadelphia, May 1-8. See April issue, page 215, for other equipment to be displayed.

Drafting Table

STEEL 4-POST DRAFTING TABLE is furnished in five combinations, ranging from the basic table without drawers to a table equipped with five shallow drawers. Gauges of steel used in table base and drawers selected to assure



rigidity and trouble free performance. To prevent marring of the floor, wood shoes are inserted in all legs and equipped with no-mar, skid proof levelers. Mayline Co., Inc., Sheboygan, Wis. Space No. 1234.

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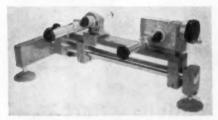
Gages



PORTABLE ULTRASONIC THICK-NESS MEASURING INSTRUMENT, battery-powered Sonizon SO-200, is a direct reading unit for measuring thickness of steel, brass, nickel, copper, aluminum, and almost every other material which transmits ultrasonic sound. By simply placing a probe on the surface of the piece to be measured and rotating a dial, it gives an instantaneous reading of thickness. Magnaflux Corp., Chicago, Ill. Space No. 102.

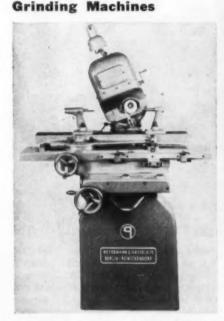
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ASTE EXPOSITION . .



OPTICAL INSTRUMENT measures expansion or contraction of specimen materials, including creep. Gaertner Scientific Corp., Chicago, Ill. Space No. 426.

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TOOL AND CUTTER GRINDING MA-CHINE offers a direct setting and reading of the clearance angle by tilting the grinding wheel into the desired angle, keeping the solid toothrest in the center point of the radius. Once the machine is set up, no head height adjustments are necessary for cutters of different diameters. For grinding primary and secondary clearance angles, no more adjustments are necessary than dialing the desired angle on a clearly graduated scale. For spiral fluted cutters the head with the tooth rest can be tilted into the helix angle. The wide face of the toothrest is always parallel to the cutting edge without the need for a special adjustment. A new copying attachment for easy grinding of tapered bridge reamers will cut the resharpening cost of these tools. Cawi Machine Co., Inc., Jersey City, N.J. Space No. 972.

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CAWI-SPIRAL DRILL GRINDING MACHINE Model N-4-90-Z grinds the cylindrical pilot on counterbores, pilot drills, combination drills. A clutch arrangement engages or disengages the cylindrical drive. The grinding of the cylindrical pilot and the relieving of the cutting edges is automatically done in one operation on two-, three- and four-lipped tools. The cylindrical grinding is controlled by a feed wheel with a

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with 3

THE STAR BLADES GIVE ALL 5

- 1. Uniformity in fabrication
- 2. Proper Hardness
- 3. Efficient Tooth Design
- 4. Sufficient Set for Clearance
- 5. Clearly marked for Ease of Identification



Point 3 of STAR'S FEATURE CHECKLIST EFFICIENT TOOTH DESIGN

All Star Hack Saw Blades are toothed on special machines to insure uniformity of teeth, gullet and "aet." This means maximum life of the blade and elimination of blade "binding" while cutting. Star Hand Hack Saw Blades come with 14, 18, 24 and 32 teeth to the inch and power blades 3, 4, 6, 10, 14 and 18 teeth to the inch to give you the best, most efficient blade for any metal cutting job.



No. 20

No. 10 — Green molded handle. Almost indestructible. Shaped for comfort. Patented Lever-Lock positions, tensions blades automatically. No. 13 — Red molded handle, chrome-plate finish. Same features as No. 10. Long a favorite with mechanics, this gunmetal finish adjustable pistol-grip frame with lever for lock blade features extra easy blade change.





Manufactured by

CLEMSON BROS., Inc., Middletown, N. Y., U. S. A. Makers of Hand and Power Hacksaw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Lawn Machines



Please send the STAR Metal Cutting Chart-A handy guide for the shop metal worker.

Address Zone State @ 4401

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ASTE EXPOSITION . . .

.001" micrometer reading. Machine can be equipped with a web thinning attachment to reduce the web thickness and to correct the last errors of a drill when the difference in the flute depth throws off the parallelism of the cutting edges. Positive or negative rake angles alongside the cutting edges can be ground for special applications, i.e. drilling cast iron, copper, brass. Model N-4-90-Z grinds drills or similar tools from 1/32" to 2" diameter. The drill point angle does not depend upon the shape of the grinding wheel. It may be easily varied by adjusting the planetary gear head to the desired angle on a wide scale within the range of minus 10° to plus 180°. Cawi Machine Co., Inc., Jersey City, N.J. Space No. 972,

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WEB THINNING MACHINE will solve the problem of heavy webs by thinning them out correctly and accurately through an index arrangement. The variation in the flute depth is corrected by bringing the chisel edge back into dead center. Positive or negative rake angles alongside the cutting edges can be ground for special applications. The crank-shaft point (also called split point) may be produced easily and accurately. Machine is also capable of grinding an undercut alongside the cutting edge for producing rolling chips, especially for automatic screw machines where long chips cause trouble. The capacity is from 1/16" to 2" diameter. Cawi Machine Co., Inc., Jersey City, N.J. Space No. 972.

Use postpaid eard, Circle No. 86



CRESTA UNIVERSAL CYLINDRICAL GRINDER Model 512 has a swing of 10" and is being supplied with 20", 30", or 40" between centers. Cylindrical grinding as well as plunge-cut grinding are

features. Machine is fully hydraulically controlled; a single lever facilitates its operation. A swivelling internal spindle is also available and the machine can be equipped with a number of measur-

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METALWORKING MACHINES Consult the yel-low pages of your phone book for the name of your nearest Di-Aero distributor or write us.



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Hydra Power Bender 2 Models



Rod Parter 2 Models



Power Parter 1 Model





Power Notcher 1 Model



Press Brake 1 Model







Power Punch 2 Models



Brakes 10 Models



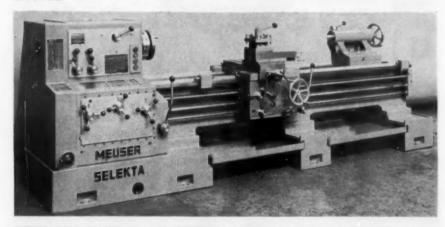
Powersher 4 Models

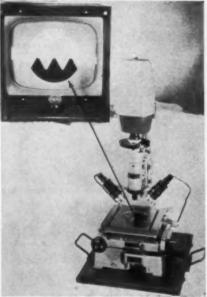
ASTE EXPOSITION . . .

ing instruments indicating the grinding results in dial gages, signal lights, or fully automatic backfeed. Eric R. Bachmann Co., Long Island City, N.Y. Space No. 704.

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Lathes





BARER-MEUSER LATHES, S-type (Selekta) and L-type, are suitable for high production. Quick change gearbox gives wide threading and feed range: 321 different threads, 174 longitudinal feeds and 174 cross feeds on the S-type; 262 different threads and 88 each longitudinal and cross feeds on the L-type. Barer Engineering & Machinery Co. Ltd., Champlain, N.Y. Space No. 1370.

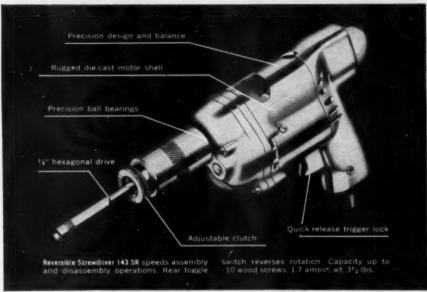
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Microscope

TOOLMAKERS' MICROSCOPE in combination with a closed circuit TV system produces an image, normally seen through the eyepiece of the microscope, on a TV screen for remote or multiple viewing. Gaertner Scientific Corp., Chicago, Ill. Space No. 426.

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R to boost job efficiency with REMINGTON tools





Flexible Shaft Machine 8 FGP for grinding or sanding has full 360° swiveling pedestal base, 6' shaft, 3 HP motor geared to operate at 4,500 rpm.



Grinder, PG 506S; air - powered; 6" wheel capacity; 6,000 rpm at 90 psi pressure; governor for even speed; steel motor housing takes rough handling.

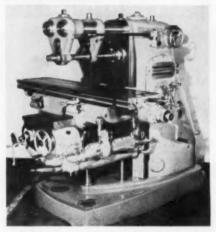
Here are power, speed and maneuverability to cut time on the tough jobs. Remington Power Tools are precision-built for long service, minimum maintenance. Choose the power most efficient for you. Remington tools are available in air, electric or gasoline-driven models. Your local Remington dealer offers complete information. See him today!

MALL TOOL COMPANY

Division of Remington Arms Company, Inc., Bridgeport 2, Conn. In Canada; Mall Tool, Ltd., 36 Queen Elizabeth Blvd., Toronto, Ontario.

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ASTE EXPOSITION . . . Milling Machines



HEAVY DUTY MILLING MACHINE, Model 4HG, weighs 14,400 lb. and is equipped with a 25 hp motor. It is equally suitable for high speed steel cutters or tungsten carbide cutters with negative, zero or positive rake. The machine will be demonstrated with high rake milling cutters, manufactured of high speed steel, milling steel at 30" per minute feed rates. Adcock & Shipley, Ltd., New York City. Space No. 1470.

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2JUR UNIVERSAL MILLER has a table size of 50" x 10", is capable of heavy production. The No. 50 taper spindle runs in four ball bearings of the dual purpose, angular contact type capable of taking both thrust and journal load. Twenty-four spindle speeds are provided and the motor is 5 hp. Exhibit will feature a roll milling demonstration on steel at a feed rate of 15" per minute. Adcock & Shipley, Ltd., New York City. Space No. 1470.

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ALEXANDER deep throat engraver

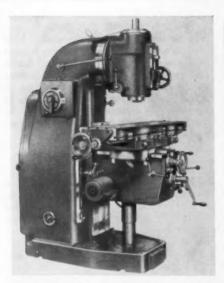
does ...

Precise, two-dimensional work. It handles workpieces up to $10^{\prime\prime}$ high, $38^{\prime\prime}$ wide, on a worktable $20 \times 8^{\prime\prime}$; optional auxiliary table $18 \times 24^{\prime\prime}$. Ratios—1:1 to 1:50. Spindle has fine and coarse feed adjustments. Cutters up to $1/4^{\prime\prime}$ dia. Speeds—2800 to 15,000 rpm. 1/4 hp motor.

Write for Catalog A.

J. ARTHUR DEAKIN & SON 150-28 Hillside Ave., Jamaica 32, N.Y.





SAJO VERTICAL MILLER VF-54-P. a Swedish import, is powered by a 71/2 hp main drive motor and separate 11/2 hp table feed motor. Table size is 52" x 11". Spindle speeds: 16, from 39 to 1500 rpm. Spindle is constructed of a double row staggered roller bearing mounted close to the spindle nose, immediately followed by a separate pair of thrust ball bearings. At the end of the spindle is a single row roller bearing. By selecting cylindrical roller bearings for radial thrust and ball bearings for axial thrust, these two separate functions are correctly divided for greater efficiency. Austin Industrial Corp., White Plains, N.Y. Space No. 1471.

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Punching Machinery

TUBE-PIERCE MACHINE is said to pierce up to 600 tubes with round or irregular shaped holes per hour. Control is given, for as the punch engages the work, tube and mandrel are held rigid by the action of upper and lower



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Speed your riveting production with Linley Noiseless Riveters. We'll give you, without obligation, cost and time estimates of doing it the Linley way if you'll send us samples of parts to be riveted.

Linley Riveters will do rivets up to 3/6" in diameter in iron and cold rolled steel; 'arger sizes in brass, alumiium, etc.

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ASTE EXPOSITION . . .



compression inserts. As many as three standard heads may be used for multiple piercing operations in one loading. Two models available pierce tubing up to 3" dia. Koppy Tool & Die Co., Ferndale, Mich. Space No. 915.

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Steel



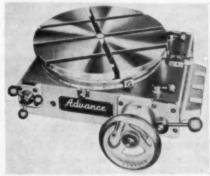
ULTRA HIGH STRENGTH STEEL, VASCOJET 1000, is the makeup of the 10" dia, rotor forging pictured, which

will be on display at the exhibit. This forging with an integral axle was formed in a closed die from a cylindrical blank with a single heating and is indicative of the easy fabricability of this steel. It offers great strength-to-weight ratio at room and elevated temperatures to 1000°. Vanadium-Alloys Steel Co., Latrobe, Pa. Space No. 533.

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SPECIALTY STEELS, Mel-Trol, a quality control system used in specialty steels production, offers: (1) precise control of scrap composition to prevent contamination of the steel with impurities that cause segregation: (2) rapid and exact control of chemical composition by spectrographic analysis, permitting each melt to be adjusted to the best balanced composition: (3) exact temperature measurements of the molten steel to permit control of composition, deoxidation, pouring temperature, and other variables influencing ingot quality; (4) progressive uniform solidifying obtained through use of the Mel-Trol ingot mold. The Carpenter Steel Co., Reading, Pa. Space No. 725. Use postpaid eard. Circle No. 94

Tables, rotary



15" PLAIN ROTARY TABLE features 30 seconds rotational accuracy, sealed base construction with moving parts

AMES



have contour-lapped pinion teeth for greater accuracy.

Because tooth form determines how well pinions mesh — Ames hardens, contour laps, and carefully inspects pinions for perfect tooth form and finish. The result: Pinions that mesh perfectly and a complete absence of "play". This extra attention to detail is typical of the Ames manufacturing approach. It helps explain why so many companies specify Ames Dial Indicators as "preferred". Write today for complete information.

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MANUFACTURERS OF MICROMETER DIAL GAUGES . MICROMETER DIAL INDICATORS

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May, 1958

199

ASTE EXPOSITION . . .

running in an oil bath, instant worm disengagement, expansion type brake and lock, and rotational stops. Advance Products Corp., Benton Harbor, Mich. Space No. 2111.

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Thread Rolling Head

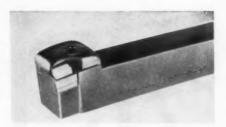


SELF-OPENING THREAD ROLLING HEADS (Acme-Fette) are designed for use with either rotating or non-rotating spindles to permit user to roll parallel thread forms or perform burnishing operations from the end of parts on present turning equipment, such as drill presses, hand lathes, turret lathes and automatics, at increased speeds. Eight sizes of head styles provide a capacity range from 1/16" to 2". The National Acme Co., Cleveland, Ohio, Space No. 2115.

Tool Holder

SANDVIK COROMANT T-MAX THROWAWAY-TYPE TOOL HOLDER. Spring lifted, three position, chip breaker enables a change of carbide

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cutting edge and depth of cut without removing or replacing chip breaker. Insert seats accurately in precision-made recess. No protruding parts, two or more holders can easily be clamped together. It has heat treated alloy steel shank, HRC 50. Sandvik Steel, Inc., Fair Lawn, N.J. Space No. 2118.

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Truck, power driven



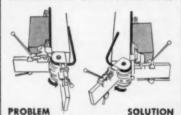
HYDRO-BOOM. The operator can by telescopic action position work loads with machine tool accuracy to within 1/100 of an inch in vertical, longitudinal, and cross-wise directions of travel. The vertical and longitudinal travel is operated hydraulically and the cross-wise travel is mechanically operated. Capacity of boom truck at maximum boom extension is 1500 lb.; with boom fully retracted, 2500 lb. Vanguard Engineering Co., Cleveland, Ohio. Space No. 1063.

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PINES PENDER

ADVANTAGES OF PIVOTING HEAD



Counter-clockwise rotation results in work piece striking machine base. Changed to clockwise operation, machine makes 120° bend without interference.

New Model 1400 Handles Both Clockwise and Counter-Clockwise Operations . . .

For experimental, small lot, and production work, Pines Model 1400 Bender offers outstanding advantages. Designed with double tool-holder ways and a pivoting head assembly, you can handle multiple planes and odd shapes fast and efficiently. Change-overs from clockwise to counter-clockwise operation can be made in about two minutes. Designed for handling bars, rolled shapes, extrusions, and tubing up to 1¼" O.D., the machine features economical, quick-change tooling, smooth, hydraulic operation, and degree-of-bend turret selector. Typical production speed is 300 to 400 bends per hour.

PINES ENGINEERING CO., INC.

ecialists in Tube Fabricating Machinery 690 WALNUT . AURORA, ILLINOIS

WRITE FOR NEW

Gives latest information, specifications, and production and tooling data



PRODUCTION BENDING . DEBURRING . CHAMFERING MACHINERY

ASTE EXPOSITION . .

Tube End Forming Machine



TUBE END SHAPES. Equipment with tooling to form complex shapes on the ends of tubing in one operation will be featured. Illustrated are some of the tube end shapes. Usually these complicated shapes would require multiple forming operations. Equipment will be operative for the manual handling of tubes, and with automatic feeding and ejection mechanisms. Vaill Engineering Co., Waterbury, Conn. Space No. 508.

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Vibration Control



MULTIPURPOSE IRD SYSTEM eliminates bearing failure, fatigue, chatter, vibration, wear, noise as follows: (1) Checking—Machine and products are inspected with the new IRD Model 305 portable vibration meter for an acceptable or excessive vibration level. (2) Troubleshooting—is continued with the analyzer and portable balancer such as the new Model 600. Cause of vibration

is pinpointed. (3) Dynamic balancing—is performed with Model 600 as part of multi-purpose Models 101, 102, and 103 dynamic balancing system. Using the analyzer as the electronic brain of the balancing machine prevents costly duplication of equipment. International Research and Development Corp., Columbus, Ohio. Space No. 209.

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W139 and W339 ADJUST-O-MOUNTS are said to be outstanding in their ability to reduce plant noise, shock, and vibration. High damping inherent in Met-L-Flex causes the press to settle down more quickly between each stroke, thereby permitting faster operating speeds, according to the announcement. The mounts utilize Met-O-Flex stainless steel wire resilient cushions. They are also claimed as impervious to oils, solvents, and moisture. Typical applications include punch presses, grinders, milling machines, lathes, drilling machines, etc. Robinson Aviation Inc., Teterboro, N.J. Space No. 841.

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Vises

FLOAT-LOCK INSTANT-CHANGE vise assures positive anchoring on drill press table. It floats and locks in any position; holds the work safely for accurate drilling and tapping. Exclusive

A wheel for every job . . .

For every surface grinding job . . . whether tough as copper or fragile as glass . . . there's a Blanchard wheel that's best.

Blanchard grinding wheels, for use on Blanchard Surface Grinders, are made in cylinder, segment and sectored types. By selecting from a variety of vitrified, resinoid and silicate bonds and a number of different abrasives, Blanchard is able to make exactly the right wheel for every surface grinding job.

Precision duplication in the manufacture of every Blanchard grinding wheel assures you of identical results on all materials regardless of finish or stock removal required.

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Gentlemen: Please send me free copies of "Blanchard Abrasive Wheels and Segmenta" and "The Art of Blanchard Surface Grinding" (3rd edition)

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ASTE EXPOSITION . . .



strated at the Show. AMF Tool Division, American Machine & Foundry Co., Bloomfield, N.J. Space No. 1164.

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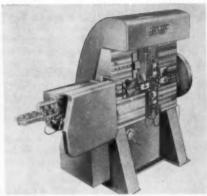


IMP HOLD-DOWN VISE is reported to eliminate use of parallels to raise the work, and the design of the spring-loaded hold-down jaws seats the work accurately. Grinding operations to parallel the work can be omitted, as work is machined parallel in the vise. Two sets of interchangeable jaws (1/8" and 15/32" thick) are furnished. Illinois Metal Products, Chicago, Ill. Space No. 1168.

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Wire Forming Machine

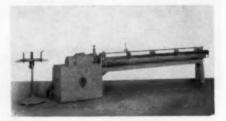
V-187 VERTIFORM, is basically an automatic 4-slide machine with the forming done in a vertical rather than a horizontal plane. Forming slide rolls have needle bearings and are placed



in the center of the slides to give a centralized thrust from low-angle barrel cams, mounted rigidly in the frame to completely eliminate shaft spring. With this design, "lift up" and "twisting" action is reported as reduced to a minimum. There is the advantage of an unobstructed view of the product. The machine handles wire up to .187" in dia. and ribbon metal stock to 1½" wide. The A. H. Nilson Machine Co., Shelton, Conn. Space No. 1817.

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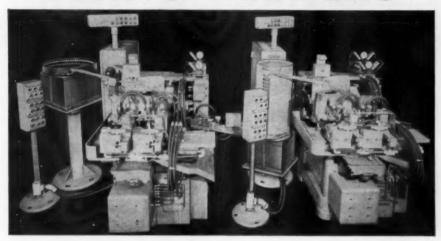
Wire Straightening and Cutting Machine



NO. O AUTOMATIC WIRE STRAIGHTENING AND CUT-OFF MACHINE has been designed to straighten and cut wire of almost any analysis including ferrous and non-ferrous from 16 ga. down to 28 ga. It is rugged and built for continuous auto-

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PARTS FEEDERS



Receive, store, orient and discharge parts at controlled rates from one operation to another

SYNTRON Transfer & Storage Parts Feeders are designed to reduce costs and increase production - eliminate tote box storage and manual handling of parts - save valuable floor space.

SYNTRON Transfer & Storage Parts Feeders provide the automatic link between processing operations. They automatically receive, store,

orient and transfer parts at a controlled rate from operation to operation. Parts may be conveyed up or down Spiral as required.

The Electromagnetic drive provides long, dependable service with low operating and maintenance costs.

Check the advantages of SYNTRON Transfer & Storage Parts Feeders in your operation. Our engineers will be glad to discuss their application with you.



NTRON COMPANY Homer City, Pa. 300 Lexington Ave.

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ASTE EXPOSITION . . .

matic duty on the production line. The six die arbor or spinner is the adjustable center type. Speeds and feeds are infinitely variable through the transmission from 0 to 100 f.p.m. A new type stop and release mechanism actuates the clutch with feather weight pressure. Geo. C. Patterson Machine Co., Cleveland, Ohio. Space No. 1174.

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Any Stock BLANCHARD GRINDING

to 85" diameter and up to 20" x 129"

• 24 Hour Service

Steel and Aluminum Plate, any size, shape or thickness.

Weldments.

· Shear blades sharpened up to 10'

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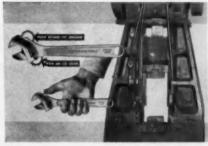
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KEO CUTTERS.

25040 Easy St. Roseville, Michigan

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Wrenches



"SUPERJUSTABLE" LINE OF WRENCHES will be displayed. Included also will be Williams Lock-A-Just wrenches in which many improvements have recently been made. With these wrenches, just a flick of the thumb or finger is all the effort necessary to lock or unlock the adjustment instantly at any opening selected. A working model of a board-drop forging hammer will also be featured. J. H. Williams & Co., Buffalo, N.Y. Space No. 2009.

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AIR-POWERED IMPACT WRENCH, reversible, %" heavy-duty capacity, has an all-steel nose housing which withstands severe handling on tough jobs. Specs.: 6000 rpm motor; 1/2" square drive; spindle offset 11/8"; height 7-1/32"; length 6-13/16"; weight 6 lb. The Aro Equipment Corp., Bryan, Ohio. Space No. 1810.

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BREAK THE "PROFIT SQUEEZE" WITH BRIGHTBOY

Improve Your Product at Lower Cost

The unique working action of multi-use Brightboy (abrasive and rubber functioning simultaneously) produces a finish that frequently constitutes the final polish.

Brightboy is a stock line, made in a wide range of Silicon Carbide and Aluminum Oxide grains. Each in grades from extra fine to extra coarse, in soft, firm and tough rubber binders. The compound is in the rubber. No muss! No fuss!

Brightboy numbers are JOB-MATCHED to your finishing requirements; often take the place of "special" compounds; prove their versatility on regular and special finishing. A Brightboy finish frequently constitutes

the final polish, without necessitating an extra operation.

Made in WHEELS, STICKS, RODS & BLOCKS for machine and manual applications. Ask your dealer to recommend the Brightboy numbers for your needs, and for the Brightboy catalog listing applications and machine speeds. Write for "Notes From The Brightboy Service Engineer," describing Brightboy applications and uses.

Write for FREE SAMPLE BRIGHTBOY HAND PIECE for quick-job cleaning.



BRIGHTBOY INDUSTRIAL DIVISION WELDON ROBERTS RUBBER CO.

95 North 13th Street . Newark 7, N.J.

America's Pioneer Manufacturer of Rubber-Bonded Abrasives



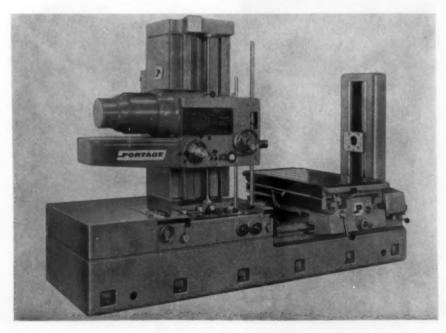
Horizontal Milling, Drilling & Boring Machine

This new 3" horizontal milling, drilling and boring machine is designed for economical, fast and dependable work. Workpieces of many sizes, shapes and materials can be machined on it.

The new construction and control arrangement is claimed to permit fast positioning and handling in both long or short run lots. Power, spindle speeds and infinitely variable feed are carefully selected to provide the best combination for operations with large or

small cutting tools. Strength, rigidity and precision are built-in features making the machine suitable for tool room use, general production, or roughing work.

Separate spindle drive and feed drive motors offer a maximum of power to the cutting tools at all speeds and provide a flexibility of feed motions required for economical tooling. Infinite variable feed rate control permits control of surface finish and chip load. The feed rate setting is shown on a



\mathbf{X}

for the size Lathes You Need Most

Sheldon lathes are built in the sizes you need most, for toolroom and production jobs. They are available with swings of 10". 11" and 13". . . in varying bed lengths with 18" to 48" center distances . . . and . . . in your choice of pedestal, cabinet or bench mountings.

Powerful, all-V-belt, drive units-either the standard 8-speed (or 16-speed) E-drive; or the production favorite, a rapid, levershift U-drive. Where higher spindle speeds are desired, the standard E-drive can be built to provide speeds up to 2,000 r.p.m.

All Sheldon Lathes have handscraped, built-in precision. Each lathe is guaranteed to meet or surpass the American Standards



Sheldon-Built Sebastian 13" and 15" Geared Head Precision Lathes



SHELDON Horizontal Milling Machine 12" Shaper

SHELDON

SHELDON MACHINE CO., Inc.

Builders of Sheldon Lathes, Milling Machines, Shapers and Sebastian Lathes.

4242 North Knox Ave. . Chicago 41, III.



the accuracy tests actually performed on that lathe. (19 checks).

Important optional features include: hardened bed ways, L00 Long Taper Key Drive spindles, 4" D1 Camlock spindles, bed turrets, taper attachments and a complete line of toolroom and production accessories.

The new Sheldon-built Sebastian Geared Head Lathes have greatly increased work capacity and many advanced features. These include a wide, heavy, hardened and ground bed . . . easy shifting spindle speed dial . . . 60-pitch gear box . . . independent drop lever apron clutches . . . cam-action tailstock clamp . . . and, automatic lubrica-

tion in the headstock and apron with "1-shot" lubrication of carriage.

Send in coupon or write for catalogs and names of nearest Sheldon and Sebastian Distributors where you can see these new lathes in operation.

SHELDON MACHINE CO., INC. 4242 North Knox Avenue, Chicago 41, Illinois

Gentlemen: Please send new catalogs describing:

- Sheldon | 10", | 11" | 13" Lathes Sebastian 13" and 15" Geared Head Lathes
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- LATHE CENTER LUBRICATION SCORING-GALLING
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CMD Lube has solved many like it with excellent results. Perhaps CMD will be your answer, too!

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Anti Scoring Lubricant CHICAGO MANUFACTURING AND DISTRIBUTING CO.

1906 West 46th Street, Chicage 9, Illinois Use postpaid card. Circle No. 348 feed. Feed rates can be changed at the operator's option while feeding, even with the cutting tool under load. An extra low range shift is provided on the saddle feed for fine boring. Full range of saddle feed is from 30.0" to 0.03" per minute.

A double rack and pinion with heavy duty double row ball thrust bearings on the spindle provide for feed in and out of the spindle. This open center design permits heavy thrust loads without distortion; the thrust load is directly transmitted.

Through-hole spindle with N.M.T.B.A. No. 40 taper socket and with \(^{5}''\) draw bar through the spindle is available. With this is furnished a draw bar wrench built in to the rear of the headstock. Control levers, handwheels and button stations are closely grouped and arranged for fast, sure operation of the machine.

Standard machine sizes:

Specifications—spindle diameter 3"; spindle nose No. 5 Morse taper; spindle continuous feed travel 24"; table work surface 28"x44"; table top height from floor 31"; table cross travel 30"; head-stock vertical travel 30".

Portage Machine Co., Sweitzer Ave., Akron, Ohio.

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Turret

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permit successive tools to be swung

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accurately

and locked

rigidly

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Multiple tool jobs become continuous when you use McCrosky Turret Tool Posts. They permit engine lathes to handle - efficiently and economically - a wide variety of work that otherwise would require a turret lathe or specialized machine. Ruggedly built. 12 indexing positions. Mount in the T-slot of the compound rest or bolt circle of the main slide. Unsurpassed for performance and satisfaction. Write for a fully descriptive catalog today/



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Chrome Plated Circular Saw

Made of Simonds electric furnace steel, scientifically heat-treated and accurately ground, the fast-cutting saws. called Si-Clone, are given a hard, chrome plated finish. This is said to prevent rust and accumulation of gum and pitch.

Nine types of saws, up to 12" in diameter, are available with a choice of



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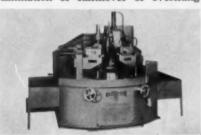
round, square, oblong, or diamond shape centerhole. Saws are "see-saw" packaged.

Simonds Saw and Steel Co., Fitchburg, Mass.

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Chucking Lathe

An automatic vertical production lathe, the Vertimax, claims outstanding rigidity, the secret of which is the elimination of cantilever or overhung



Vertical chucking lathe with guards removed, illustrating twin tool slides.

type support for the tool slides. The design of the machine is based on tool slides supported at both ends, providing rigidity as well as a method of adjusting tool position by means of calibrated eccentrics. The machine can be used for small quantities, as setup, changeover, and tool change are said to be quick and convenient.

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NEW Heavy Duty Fen Automatic Wrench



Illustrated above is the Model 4MH showing the heavy duty construction.

For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

The Model 4MH Fen Automatic Wrench was designed for hi-duty cycle. Therefore, it can be used on hi-production automatic equipment The Model 4MH incorporates an impact reactor which reduces the load on the fixture and increases the life of the holding device.

THE FEN
MACHINE COMPANY
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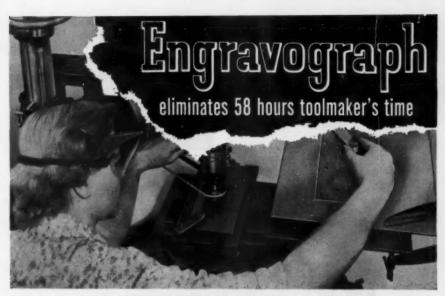
Hand Truck

The Stackbin-Stackrack hand truck provides increased flexibility in storage and handling of common parts. Sizes of hand trucks are available to suit individual plant requirements, Stackracks lock securely to trucks without tools or fasteners.

Stackbin Corp., 1085 Main St., Pawtucket, R.I.



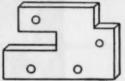




Problem: To cut a shape and drill 4 holes

Material: .050 aluminum. Quantity: Approximately 500 pieces.

Conventional die and jig methods require 40 hours toolmaker's time to make the die, and 18 hours for the drill jig. The run would entail two handling operations, first stamping, then drilling holes.



Engravograph method: Make one master (approx. 4 hours). Use ENGRAVOGRAPH Model H to profile the shape, spot and drill the holes in one operation.

In addition to eliminating tooling costs, the ENGRAVOGRAPH itself is a fraction of the cost of either of the two machines that would have been tied up, and can be operated with top efficiency by SEMI-SKILLED OF UNSKILLED labor.

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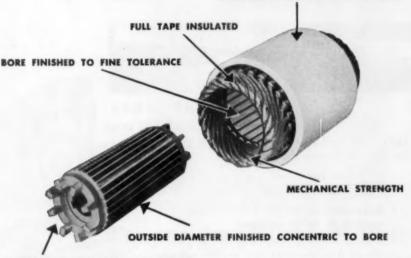
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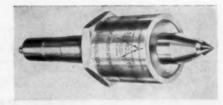


S. A. WOODS MACHINE CO. 27 DAMRELL STREET BOSTON 27, MASS.

Live Center Has Guaranteed Accuracy

A super precision live center claims accuracy to .00020" (twenty millionths) F.I.R. for precision turning and grinding.

The extended nose spindle is carbide tipped, and the wheel base bearings are sealed and grease-packed for lifetime lubrication. Exclusive spring design compensates for up to .020" axial growth due to thermal expansion, with-



out impairing accuracy.

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IN THE HEIGHT OF A YARDSTICK

- Up to 300 spindles tap or drill simultaneously.
 - Self-contained, rigid design, rugged construction.
 - Automatic air-oil feed, with quick setting of table advance.

As sturdy as it is compact, this equipment performs multiple spindle, high production drilling and tapping at low cost. Head remains fixed as table feeds work into spindles, promoting rigidity and accurate results. Find out how profitably Zagar tooling as applied to this package can deliver your more holes at a lower cost ever before.



Write for Data Sheet 845-B.

ZAGAR, INCORPORATED, 23900 Lakeland Blvd., Cleveland 23, Ohio

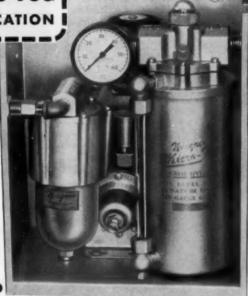


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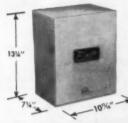




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Compact, Tamper-Proof Cabinet Units

lubricate all bearings, gears, chains and cams on a machine



1 QT. OR 2 QT. OIL CAPACITY 200 OR 300 BEARING INCH RATINGS

Provide ideal lubrication by applying just the right amount of air-borne oil fog to all bearing surfaces. Includes an automatic-drain air line filter, a solenoid valve, a pressure regulator, a pressure switch and a MICRO-FOG Lubricator...plus these advantages:

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C. A. NORGREN CO.

3428 SOUTH ELATI STREET

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May, 1958

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219

Indexing Unit Has **Smooth Operation**

A fast-indexing unit, with a 330 lb. dial, is said to index 90 degree with a smooth, shockless operation in as little as 7/10ths of a second. It has control adjustable for speed and dial load. Photograph shows 3/4" dia., 4 pitch steel parts being tapped two per cycle by Kaufman Model 66.

Kaufman Mfg. Co., Manitowoc, Wis. Use postpaid card, Circle No. 114





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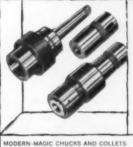
Stoning hardened steel ring with Schauer Type NA28 Speed Lathe.

These versatile, low-cost machines provide the fastest. most economical method of filing, deburring, polishing or lapping metal and plastic parts. There's a Schauer Speed Lathe to solve practically any secondary finishing problem. Many sizes and models with holding devices to suit the job. Speed your production with Schauer Speed Lathes. Write for Catalog No. 530.

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is on the production line!

These tools don't belong in a showcase. They're beautifully made, to be sure, but they're made for work-all kinds of work. All J&L thread tools guarantee Class III threads or better, every time, through a system of "no approximations." They give long chaser life, foolproof resharpening, and extremely low cost per piece. What's more, they are backed up by the world's most modern thread tool plant, have world-wide distribution outlets, and are augmented by a trouble-shooting team of seasoned field engineers.

Incidentally, watch for J&L's newest service to industry -"Trouble-Shooting Threading Problems" - soon to appear in these pages. Better still, let us help you with your threading operation so trouble won't crop up.

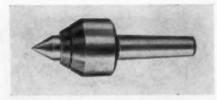


JONES & LAMSON MACHINE COMPANY, 520 Clinton St., Springfield, Vt., U. S. A. Use postpaid card. Circle No. 361

Live Centers

These precision live centers have an exceptionally low overhang and a recessed body for better clearance, according to the announcement. Special high-precision angular contact bearings allow accuracy of concentricity up to .000075".

The live centers and bull-nose centers come in all standard sizes with straight shanks and Morse taper shanks Nos.



1 through 6.

R.B. Tool Co., Inc., 785 North Broadway, White Plains, N.Y.

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PRECISE PRODUCTS CORPORATION
3731 BLUE RIVER ROAD, RACINE, WISCONSIN, U.S.A.
BRANCH PLANT: PRECISE G.m.b. H., DUESSELDORF, GERMANY

\$1600*

will put this <u>Power Press Brake</u> to work in your shop in a matter of days...

DELIVERY FROM STOCK

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48" long, 90° "V" dies for handling 16 ga. stock in the 16-48 are priced at \$102.

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... and an UNLEVEL machine will vibrate! Machine vibration can result in excessive machine downtime, quality control problems, loss of precision, shortened machine life. To avoid these costly hazards, set your machines level, keep them level, with Empco Leveling Jacks! Easy to install, Empco Jacks provide a solid, easily adjustable foundation for machine tools, large surface plates, automation lines, tool room and production equipment of all types. Used with Vi-Sorb Mounting Pads, they further reduce objectionable vibration, retard creepage, and often eliminate the need for anchor bolts. Can you afford to be without them?

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Angular accuracy within 2 minutes... repetitive accuracy in low "tenths" of a thousandth

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the economical way to smash automation bottlenecks

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That's where Erickson Indexers really pay off. For you can interlock them into your production set-up with micro switches and solenoid valves. The hardened and ground lock pin operates in conjunction with the actuating mechanism to assure positive positioning and angular accuracy within 2 minutes of a degree. (Repetitive accuracy is no indication of angular accuracy. Erickson holds repetitive accuracy in low "tenths" of a thousandth.) And Erickson Indexers can maintain this great accuracy because their adjustable, self-contained shock control unit delivers a cushioned rotary load to the mechanism, thereby reducing wear.

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ERICKSON TOOL COMPANY

34361-5 Selen Read . Selen, Ohio

COLLET CHUCKS . FLOATING HOLDERS . TAP CHUCKS . TAP HOLDERS . AIR-OPERATED CHUCKS

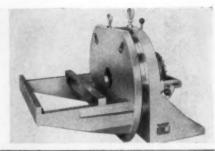
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Indexing Trunnion

Indexing trunnion, Model 300, with its larger size and increased capacity of the Timken roller bearings is reported to give smooth, easy rotation for the heavier loads.

Face plates up to 30" in diameter may be used.

Johnson and Bassett, Inc., 114 Foster St., Worcester 8, Mass.







HEVI - DUTY High Temperature "G-05-PT" FURNACE Hardening of high speed steels Temperatures to

high temperatures can be performed in this furnace. The 2600° F. muffle may be sealed is and other operations requiring high temperatures can be permuffle may be sealed if a protective atmosphere is required.

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pyramid base.

MUFFLE FURNACE This complete self-contained furnace is ideal for small scale production heat-treating requiring temperatures to 1850°F. All controls are conveniently mounted in the

Temperatures to

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MILWAUKEE 1, WISCONSIN .

Heat Treating Furnaces ... Electric Exclusively Dry Type Transformers Constant Current Regulators

Tape Control System Keeps Setup Time to a Minimum

The tape control system has been developed as special equipment on all new P&J 3U, 4U, 6DRE40, 8U, and 1OU precision turret lathes, or can be added to models now in the field.

Using a programming sheet prepared from blueprint data, and a tape punching machine, a clerical worker punches



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the holes in the tape.

The programmed tape is inserted into the machine's tape reader and the machine is set for automatic operation.

The system is of value where frequent change-over from one part to another makes it desirable to keep set-up time to an absolute minimum.

Potter & Johnston Co., Pawtucket, R.I.

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QUICK, EASY on your SURFACE GRINDER
RADIUS DRESSER \$44.00 ANGLE DRESSER \$49.00



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Chatter Resistant, Spring Loaded Spindle

Hardened shaft—bearing adjustable for wear. Diamond always perfectly centered. Easily set adjustable 180° stops.
All surfaces ground true from hole. CAPACITY—1½" Convex to 4" concave 10" Wheel size for DoALL and NORTON Grinders—\$49.00. Diamond \$8.00.

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DIVISION OF FULTON IRON WORKS COMPANY 4235 DUNCAN AVE. • ST. LOUIS 10, MO.

Toolroom Miller

The Model No. 328SPF 2 hp horizontal toolroom miller has independent infinitely variable table feed. In order to change speed or direction of feed only the flipping of a switch or setting of a dial is necessary.

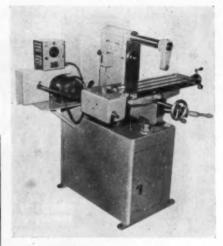
Feed range is .600" per minute to 41/4" per minute.

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A series of pilot valves-straightway. three-way and four-way models-may be used for primary applications or to control the operation of MAC's pilotoperated master valve series.

The valves feature the Macsolenoid, designed to be shock-resistant, which is mounted in the valve cover. For safety, the valves are inoperative with this cover off. Each valve in the series has been pre-tested for performance at better than 600 cycles per minute, it is claimed. In the picture, the cover has been made to look transparent to show parts.

Mechanical Air Controls, 10030 Capital, Oak Park, Detroit 37, Mich.

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Cut production time with
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Easy to set, easy to se
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MACHINE and TOOL BLUE BOOK



Horizontal Swivel Type

Horizontal & Vertical Swivel Type

Multi-Purpose Vises

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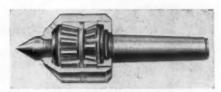
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Over 25 years experience in designing and building machinery

Live Centers Improved

Trio live centers now feature Timken tapered roller bearings, replaceable center point and a special bearing adjustment. They are mounted on the same heavy-duty precision roller bearings used on machine tool spindles. This enables them to absorb extreme thrust and heavy radial loads with minimum wear. Heavier cuts at faster turning speeds are possible.



Cutaway view of improved Trio live center.

A special built-in adjustment for preload and take-up for bearing wear prolongs the life of the center. Lubrication

The New Clearing Torc-Pac 20 An O.B.I. with a revolutionary New Air Friction Clutch

Priced at only \$1,395, this new all steel welded O.B.I. comes equipped with an airfriction clutch and brake that's unique and durable. The clutch and brake perform in oil. With this design, you get none of the normal wear that is found in a conventional air-friction clutch. Interested? Get all the details today. Send for your FREE copy of Clearing's bulletin S.B. 19.84. You're under no obligation, of course.

Also available in 30 & 45 ton capacities

CLEAPRESSESG



1,39500

the way to efficient mass production

CLEARING MACHINE CORPORATION—division of U.S. INDUSTRIES, INC.

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MACHINE and TOOL BLUE BOOK

is needed only once a year since an Oring seal at the rear of the bearing housing provides protection against entry of cutting oils, chips and dirt and seals in the lubricant.

Another major advantage of the new Trio live center is its adaptability to a wide range of machining operations due to its easily replaceable center point. Only the center point need be changed, rather than the entire live center. Center points of male, female, pipe or other design can be used according to the type of material being machined. Replaceable points are made from chromium steel, heat treated for hardness and long life. Each is precision machined for positive seal and ground to an operating accuracy of 0.0002 inch.

Trio Machine & Mfg. Co., 35700 Vine St., Willoughby, Ohio.

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HI-SPEED FOR SPECIAL JOBS?

SEE CLEARING

Clearing's line of Hi-Speed presses can be adapted to many special jobs. Here's one that's supplying a large home appliance manufacturer with metal dryer baskets.

A special control and special feeding equipment, automatically pierce thousands of holes in precisely positioned rows. An automatic Hi-Speed press like this can relieve you of many problems and speed up your manufacturing process, too.

For detailed information on Hi-Speed Presses, Write Clearing.







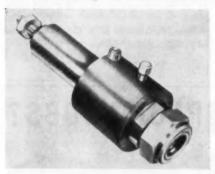
the way to efficient mass production

CLEARING MACHINE CORPORATION—division of U.S. INDUSTRIES, INC. 20 499 W. 65th Street • Chicago 38, Illinois / Hamilton Plant • Hamilton, Ohio

Drilling Tools Have Oscillating Action

Drilling tools, available in four different models, were developed for use on multiple spindle automatic screw machines.

In drilling, heat, long stringy chips and drill breakage must be contended



with. The oscillating action of the deep hole drilling tool breaks the chips into fine granules, and is said to eliminate the chip problem and afford longer drill life through cooler running.

The oscillating motion is derived from a flutter or wave cam built into the tool. It oscillates .006" three times per revolution of the drill.

Boyar-Schultz Corp., 2000 S. 25th Ave., Broadview, Ill.

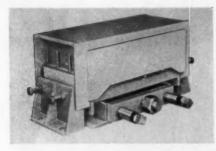
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Machinery Mount Simplifies Installing

The type SW mounting, a vibration, shock, and noise isolator utilizing steel springs as the isolation medium, is available in seven load-carrying capacities ranging from 38,000 lb. to 125,000 lb. each.

A feature of the mount is the internal device which facilitates leveling the





machine installation with less torque. It is said to float machines weighing up to 1,000,000 lb.

The Korfund Co., Inc., 48-39W 32nd Pl., Long Island City 1, N.Y.

Use postpaid eard. Circle No. 123

Press Brake

A six-foot hydraulically operated press brake is designed for light gauge sheet forming and fabricating opera-



Use postpaid cord. Circle No. 381

tions. It has maximum capacity of 20 gauge mild steel over a six-foot bed. The Model 20-72 Hydra-Power brake features stroke adjustment which enables operator to have complete control over the ram during forming and punching operations.

Ram can be inched on the press brake and can be backed off at any point in the work cycle by operating reverse lever and using the foot control.



Make 3 hammers AT ONCE!

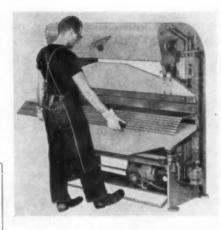


It's the NEW, easy, economical, quick why to mold your own tend hommers on a production basis with "SHUR-GRIP" handles and this COOK production mold.

Write for circular and prices LAWRENCE H. COOK, INC.

47 MASSASOIT AVENUE, EAST PROVIDENCE 14, R. &

Use postpaid card. Circle No. 382



A micrometer-type front operated back gauge, one-shot oil system, and a let-up control are accessories available.

O'Neil-Irwin Mfg. Co., 562 Eighth Ave., Lake City, Minn.

Use postpaid card, Circle No. 124



DETROIT 41, MICH.

23516 TELEGRAPH ROAD

Punch Press

Easily adapted for standard punching operations within rated capacity is the B-3 3-ton power bench type punch



press. It can runch, shear, form, blank, cut, draw, etc., materials such as metal, leather, fiber, textile, plastics, paper, etc. On continuous operation it will mass produce up to 300 articles per minute.

Straight ram guides with flat gib give accurate fitting of dies for precision operations. Standard stroke is 1" with ¼" to 1½" strokes available at additional charge.

Alva Allen Industries, Clinton, Mo.

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INDEXING MACHINERY - CAMS - GENEVA GEARS - TURNTABLES





MFG. REP. WANTED

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CHARLES EISLER, JR. PRES.

EISLER ENGINEERING CO., INC.

762 SOUTH 13th STREET

NEWARK 3, NEW JERSEY

Magnets of Chuck Polarized Horizontally

A permanent magnetic chuck, No. 824, has the advantage of magnets being polarized horizontally rather than vertically, thus subjecting the cutting tool to a demagnetizing influence during the cutting cycle. This allows free cutting without chip interference.

The chuck has work surface 81/4" wide by 24" long.



O.S. Walker Co., Inc., Worcester, Mass.

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Douglas Aircraft
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The ECONOMY Internal Gage

for holes 1/4" to 10" diameter; .0001" limits.



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This unique expanding plug gage provides positive precision and is used by the thousands in jet propulsion, automotive transmission, electric motor, household equipment and similar volume-precision programs. Its self-contained features not only make precision easy, but also ECONOMICAL beyond any gage of comparable results.

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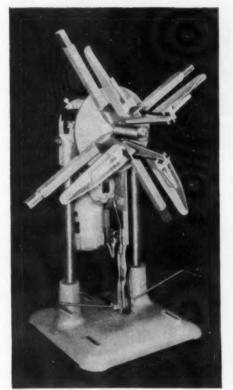
Comtor Co., 62 Farwell St., Waltham 54, Mass.

REQUEST BULLETIN 50





For the Newest in Press Room Equipment



ACR-1040 Motor-Driven Centralizing Stock Reel

U. S. TOOL COMPANY, INC.
AMPER (East Orange) NEW JERSEY

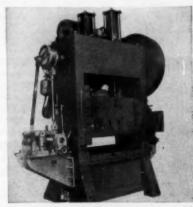
Ask for Bulletin No. 85-B

The U. S. Model ACR-1040 Motor-Driven Centralizing Stock Reel is brand new. It features a Centralizing Mechanism operated by the motor to expand and contract the cross members supporting the 1.D. of the coil. This completely mechanical operation allows the Model ACR-1040 to handle reels with 1.D. from 10° to 20° and widths up to 10°. The maximum O.D. is 40° at 16° core diameter. Operation is smooth and quiet. Model ACR-1040 is equipped with Loop Control Mechanism and 1/3 HP motor for operation on 220/440 volts, 3 phase, 60 cycle A. C. Weight capacity is 600 pounds.

The Model RF-12-12 Style "B" U. S. Rack and Pinion Roll Feed is suitable for material up to 12" in width by up to 3/16" thick. Feeding length is adjustable up to a maximum of 12".

is adjustable up to a maximum of 12".

U. S. Style "B" Roll Feeds are made in both double and single types, with bolster plate for O.B.I. presses or with adjustable mounting brackets for Straight Side Presses. All are equipped with hardened and ground rolls of hollow construction which are driven by hardened spiral gears running in oil. These gears are mounted in an enclosed housing. The roll-pin type overrunning clutch has carbide inserts. Standard equipment also includes manual roll lifters; self-equalizing brakes; two-piece adjustable driving eccentric to simplify timing the feed in relation to the motion of the ram of the press; stock oiler and eccentric operated scrap chopper. Automatic roll lifters are available in either ram operated or adjustable eccentric operated types.



RF-12-12 Style "B" Double Roll Feed

Automatic-Turntable Barrel Finishing System

A 6-station automatic barrel finishing system, mounted on a turntable and equipped with a memory device, automatically rotates completed work to a single operator station for unloading and reloading. The system completely eliminates the need for duplicate materials handling equipment.

As the operator loads each barrel, he sets its timer for a prescribed processing cycle. In so doing, the time cycle also records on the turntable memory device

which automatically signals the timedout barrel and rotates it to the operator's station when the work has been completed.

Since each barrel is individually timed, the new system will simultaneously deburr and finish a variety of ferrous and nonferrous parts requiring a wide range of time cycles. Continuous processing from 15 min. to 50 hours can thus be performed automatically.

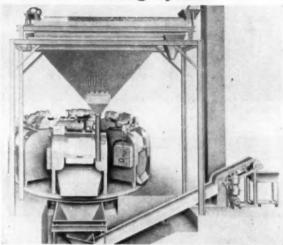
Almco, Queen Products, Inc., Albert Lea, Minn.

Use postpaid card. Circle No. 127

Four-Ton Press

A high-speed bench press, described as ideal for forming, trimming, and force-fit assembly operations, has dual hand control and adjustable downstroke control as standard. Electric pushbutton controls with or without pressure reversal are available as optional features.

Stroke is 6" and gap is 12". The fourton model has the following speeds: down, advance, 700 ipm; down, feed,



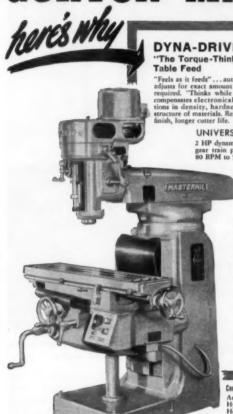


330 ipm; return, 670 ipm.

The new models bring high ram speeds and adjustable down-stroke control to the small hydraulic press field.

Hannifin Co., Des Plaines, Ill.

Eventually you'll buy a **GORTON MASTERM**



DYNA-DRIVE

"The Torque-Thinking"

"Feels as it feeds" . . . automatically adjusts for exact amount of torque required. "Thinks while it works" compensates electronically for variations in density, hardness, molecular structure of materials. Result: Superbly fine finish, longer cutter life.

UNIVERSAL SWIVEL HEAD

2 HP dynamically balanced motor with belt and gear train provides wide range of speeds from right, head, ram and turret rotate 180°. Cross movement 14 inches. Push button starting.

DOWN FEED INFINITELY VARIABLE

Feeds may be varied infinitely from 6" to 5" independent of spindle speeds. High efficiency belt drive. Direction and rate of feed separately controlled.

PERMANENT ACCURACY BUILT-IN

Distortion is prevented by extra Distortion is prevented by extra heavy one-piece column cast with over-size ribbing. . . extra heavy alloy steel turret clamping bolt (1½" dia) with 3-point clamping action . . heavy dovcard way full length of vertical column face . . extra large table, knee and 24" saddle (2" longer than table travel) . . square lock bearings with long, narrow guide between knee and addle . positive locks. extra dle . . . positive locks . . . extra heavy feed screws . . bearing surfaces hand-scraped.



Complete Versatility Through Attachments Built-in or Field Installed.

Among such equipment is, Trace-Master Hydraulic Tracer Control, Duplicator Tracer Head and/or Table with base, saddle and table in one unit, 6" Raising Block, End Measuring Rods and Dial Indicators, Self-Contained Coolant System.

Write for Bulletin 2699-1405.



GEORGE GORTON MACHINE CO.

RACINE, WISCONSIN

Tracer-Controlled Pantographs, Duplicators — standard and special . . . Harizontal and Vertical Mills, Swiss-Type Screw Machines, Tool Grinders, Small Tools and Accessories

Threading Machine Features Automatic Cycle

The Coulter Model B single point, high-speed threading lathe, automatic mechanically-operated, is said to produce internal threaded pieces up to 10" in dia. and external threaded pieces up to 6" in dia.

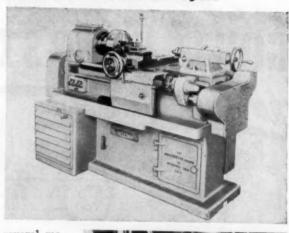
The machine has standard spindle with 10" chuck, either airor hand-operated type, which has infinite speed ranges of 250-1000, 150-600, 125-490, with special speeds, if required.

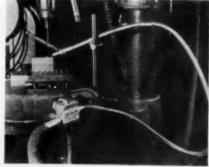
Features found usually in a combination of several machines are: a skip-feed mechanism for producing multi-start threads of 2, 3, 4, 6, 8, and 12, conveniently-located control to permit easy maneuvering of carriage positioning, and an infinite speed control for changing spindle speeds.

The James Coulter Machine Co., 136
James St., Bridgeport, Conn.
Use postpaid card. Circle No. 129



Koolmist can be applied directly to the cutting edges of tools, according to the announcement, and when chips





interfere, it can be applied from underneath onto the cutting edges.

Koolmist can be siphoned from any coolant container in the plant, with siphoning lines which can be supplied up to 50' long. One to one hundred units can be siphoned from a single large container.

There is a choice of containers available, which are said to be rustproof and unbreakable, with oil level to be seen through the container.

Lloyd Tool Corp., 921 Meridian Ave., So. Pasadena, Calif.

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JIG BORING

to your specification

At your disposal: Our sub-contract jig boring department, one of the best equipped in the East.

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Remain at Constant Settings
At Speeds Up To
450 Strokes
Per Minute

REVERSES
INSTANTLY . . .
shift feed finger
spring from one
lug hook to
opposite side.

/-----

*Patented

PATENTED
CLUTCH MECHANISM . . . with
fewer working
parts for less
maintenance

can't SLIP
.. each wedge has
four points of
contact to safeguard accuracy

NO RATCHETS
OR PAWLS . . . to
wear down and
throw off feed
spacing.

"RFC" Automatic Feeds are available for bench and pedestaltype high speed power presses. Even without pilots or finger stops, "RFC" Automatic Feeds control feeding to utmost accuracy assuring perfect blanking and no waste of stock.

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MANUFACTURERS OF QUALITY FEEDS FOR POWER PRESSES



Roll Feeds Corp.

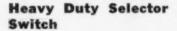
ASHTON, R. I.

Hydraulic Feed Surface Grinder

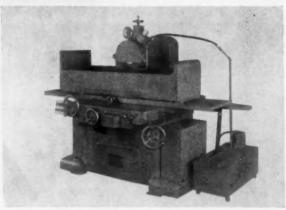
The sealed hydraulic oil tank mounted outside at right end of machine is a feature of the No. 80 Covel 16" x 36" hydraulic feed surface grinder. The hydraulic pump, motor, and relief valve mounted on platform as a unit is easily removed from front of machine when maintenance is required.

The saddle moves on two flat ways. Center guide with hardened steel tapered gib is provided to compensate for

Covel Mfg. Co., Benton Harbor, Mich.
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This ruggedly built electrical selector switch features self-wiping contacts. Originally developed for use in sawmill setworks controls, the new switch will work equally well in any electrical installation requiring heavy duty controls. It is claimed to be the first switch of its type to provide the operator with natural action . . . all motion is either to or from the user. There are no



buttons to push or dials to turn.

The model shown has six contacts; other units are available with from four to ten contacts as standard equipment. Models for more than ten contacts are made to order.

Sel-Set Machinery Corp., 290 Moyer Lane, Salem, Ohio.

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Selector switch activated through natural action.



PNEUMATIC CYLINDER PISTON RODS GROUND TO .0005" TOLERANCE . . .

ENGELBERG

CENTERLESS BELT GRINDER

The Bellows Company's Smith-Johnson Division in Glendale, Calif., makes pneumatic cylinders to power drill presses, hydro checks, rotary index tables, etc., To achieve smooth, steady action even with low air pressure, the piston rods are precision sized to tolerances of .0005" and surface finished to 8 micro-inches on an Engelberg Model L-4 Centerless Belt Grinder.

With this Engelberg Grinder parts are through-fed at 84" per minute, average belt life is 1200 production feet, and belt changes take less than a minute. The result – a 300% production increase.

Abrasive belt grinding can help you solve your surfacing and finishing problems. This technique is now recognized as one of the most rapid, economical and versatile for stock removal, precision sizing and fine finishing of almost any material. Engelberg Methods Engineers will welcome the opportunity to study your problem. Just send us drawings or typical pieces for operational analysis.



FREE!

Booklet of 33 case histories showing how Engelberg Abrasive Belt Grinders helped to solve production problems in many industries. Send for your copy today.



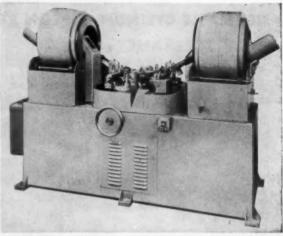
ENGELBERG HULLER COMPANY INC. 201 SENECA STREET, SYRACUSE 4, NEW YORK

Thread Rolling Machine

Model 125A planetary thread rolling machine thread rolls screws, bolts and nails at speeds of 600 to 800 pieces per minute. It handles over-all blank stock lengths up to 3 inches and diameters from No. 4 to 5/16". Other operations performed are roll forming. knurling, marking, serrating and necking.

Special features: rear loading during production: cradled hopper with external drive free of obstructions; end mounted vibrator for peak efficiency: hardened and ground feed

rolls; rapid adjusting feed rail width; expanding die mandrel for trueing die: thin-wall ring die that can be set up



Prutton Model 125A thread roller-rear loading during production.

in ten minutes to perfect concentricity. Prutton Corp., 5293 W. 130th St., Cleveland 30, Ohio.

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Hinged Hammer Moulds , 2½ and 5 lb. sizes—order your alloy lead ammer requirements from your machine tool

KITZMAN MFG. CO.

1506/ Hartwell Ave. Detroit 27, Mich. Use postpaid card. Circle No. 393

or direct from:



Use these Handy PORTABLE ELECTRIC RECIPROCATING TOOLS for Greater Production, Better, More Uniform Work—All with Less Operator Fatigue. Fixed strokes are ½" or ½" long. Operate on 110 Volts AC-DC. Deliver 1000 PUSH-PULL strokes per minute. Try one of these tools on your next job.

Send for Descriptive Literature

ACME TOOL COMPANY 71 W. Broadway . New York 7, N.Y.

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MACHINE and TOOL BLUE BOOK

Twist Drills Offered In Size Increments of .001"

Twist drills are now being manufactured and catalogued by the Hayden Twist Drill Co., Manila, Ark., in every size from .015" to 1.000" in steps of .001"; in sizes above .500" they are made in the S & D pattern. The S & D style of drill is one which has a ½" shank.

Drills below ½" dia, are made to regular jobber proportions, but tolerances on OD are held to .0005".

Use postnaid card. Circle No. 134



Hayden twist drills—.015" to 1.000" in steps of .001".



Lapping Machine

A precision lapping machine, Model 10 Lapmaster, is said to consistently reface mechanical seals, valve seats, compressor discs, fuel injector parts, and a variety of other parts to a precision flatness of .0000116" and with micro-finishes of 2 to 3 rms. The machine does not have to be stopped for redressing or truing the lap plate. Flat-



Johnson

Speaks for itself in ANY SHOP!



Model J (Heavy-Duty) (Wet or Dry Models)

Johnson Model "J"... the heavy duty band saw that speaks for itself. No other saw handles so many operations so easily and so economically. Why pay more when a Johnson Model "J" can cut the 10' rounds, 18' flats and odd shaped steels of your shop in such labor saving time. The Big "J" is completely automatic—and is available in a wet or dry model, both with variable speed and centralized control system. You can't afford to miss any information on the rugged Johnson Model "J". Contact your dealer today!



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75 N. Broadway
Des Plaines, Ill.

Western Distributor
HASTINGS DISTRIBUTORS
1605 Solano Avenue
Berkeley, Calif.

ness of the lap plate is maintained by the patented action of the conditioning rings, which are mounted on the lap plate and also serve as work holders to accommodate parts up to 3¾" in dia. If desired, the rings may be removed and the roller guide bars repositioned in order to make room for larger work up to 7".

Crane Packing Co., 6400 Oakton St., Morton Grove, Ill,

Use postpaid card, Circle No. 135

Open Ball Bearing for Zero Clearance on Shafts

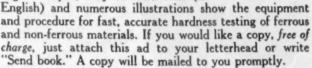
A linear ball bearing, known as open type ball bushing, permits use of shaft support members along the length of the shaft traversed by the bearings. The bearing is designed for use on shafts which must be supported to prevent deflection.

The open construction feature eliminates shake or play by adjusting. The

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About Hardness Testing

Everything you need to know about hardness testing is told in this handsome book, prepared by the makers of the internationally respected CLARK Hardness Testers for "Rockwell Testing." Simple, easy-to-read text (in



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CLARK INSTRUMENT INC.

10206 Ford Road . Dearborn, Mich., U.S.A.

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very low friction practically does away with wear. If some should develop, the play can be removed by readjustment of the bore diameter. This feature makes for long life and practically zero maintenance, according to the announcement.

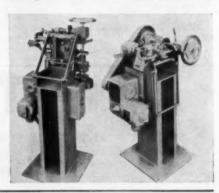
The bearings do not depend on the maintenance of an oil film. They are manufactured for shaft diameters ranging from 1" to 4".

Thomson Industries, Inc., Manhasset, N.Y.

Use postpaid card. Circle No. 136

4-Slide Wire Forming Machines Feature Flip-Top Swing Bed

The Model 00 automatic 4-slide wire forming machines include a flip top vertical swing bed. This arrangement combines the convenience of the vertical position when tooling or servicing





the machine with horizontal positioning when in operation.

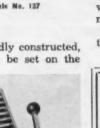
The new machines provide increased feed length up to 4½", with ample tooling areas at each position.

The Baird Machine Co., Stratford,

Use postpaid card. Circle No. 137

Magnetic Chuck

British made and rigidly constructed, any desired angle may be set on the



Fimax universal magnetic chuck by circular scales provided, by sine bar or by other means, and then locked securely in position. It is designed for better machining of tools, cutters, and gages. The chuck is said to be capable of .0005 accuracy in 12" throughout, with scales accurate to within 30 minutes.

Air Transport Equipment, Inc., Amityville, N.Y.

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THREAD GRINDING CENTERLESS GRINDING

and

PRECISION MACHINING

WARD THREAD GRINDING COMPANY

265 Howard Ave., Bridgeport, Connecticut

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Burkhard Rebuilding is Guaranteed in writing to "give the same Tolerance, Quantity and Quality of work as when new." Ask for quotations, free, on rebuilding your machines.

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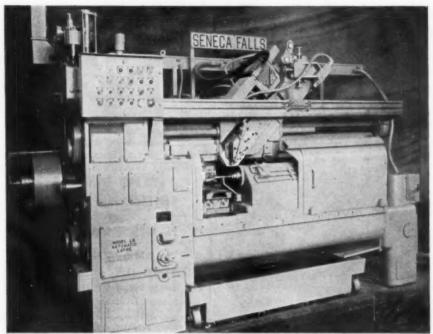


Hend Scraping is an advanced art in our plant. Why not let us quote you on rescraping your surface plates. Merely write us the size of the plate or plates.

BURKHARD BROS., INC.

P.O. Box 187 Eastwood Station 203 Wavel St., Syracuse 6, N. Y.

Use postpaid card. Circle No. 400



Model LQ automatic lathe combines rough and finish turning shafts in one operational cycle.

Automatic Lathes Combine Fast Turning Methods

The Models LQ and AQ automatic lathes were designed to combine the fastest method of rough and finish turning shafts on a single machine without removing the work piece from the centers between the two operations,

and without any attention on the part of the operator.

The roughing operation is accomplished with multiple tools mounted on a rear carriage, while the finish turning is done with single, tracer-controlled tools on one or more overhead carriages. Extremely close tolerances are maintained, it is said, since the pressure of the single, tracer-controlled tool is constant over the entire length of the work piece.

Features are simplified changeover for reduced set-up time, feed rate automatically changed during cutting cycle, screw feed to all carriages, and fourspeed head with automatic changeover.

Seneca Falls Machine Co., 10 Fyfe Bldg., Seneca Falls, N.Y.

Use postpaid card, Circle No. 139



WATTS BROS. TOOL WORKS
Wilmerding, Po.
Use postpaid card. Circle No. 401

our business letterhead will bring literature

Boring Tools Have Standard 33/8" Shank

Series 2015 solid carbide boring tools have been designed expressly for tool and die room work and have a hardened and ground steel shank of standard %" diameter by 1" length. This standard shank design eliminates changing collet and chucking setup—is adaptable to standard, commercial boring heads, eliminates special bushings and is



Series 2015 tools have minimum hole diameters ranging from .090" to .300"; hole depths to 1½".

claimed to insure greater accuracy and rigidity.

There are eight tools in the series,



WILSON AIR COLLET CLOSER



STEP UP PRODUCTION 20% __

bar stock capacity

· Hold delicate parts without damage or adjustment

- Iron grip for heavy work
 No adjusting for stock or part variations
- · Finger-tip or foot control eliminates operator fatigue

· Eliminates jarring of head stock (Ten day PREE TRIAL to reliable firms)

WILSON AIR COLLET CLOSER, INC. 909 40th Ave. NE, Minneapolis 21, Minn.

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LOWEST PRICES

Diamond Wheel Dressers

Guaranteed to be full, individual stones, mounted in 7/16 x 6" cold rolled shanks

Price

Carat 1/4-5 2.25 1/2-4.00 3/4- 6.00 - 8.25

11/2- 12.00 -16.00

- * These diamonds can be set in any shank to your specification for \$1.00 each extra.
- * Prompt resetting service

Allstate Diamond Products, Inc.

Manufacturers of a complete line of diamond tools and wheels 245 W. 27th St. CH 4-7725 New York 1, N.Y.

Dealers' inquiries invited

Use postpoid card. Circle No. 404

with minimum hole diameters ranging from .090" to .300"; the latter tool, G-7. has a possible maximum hole depth of 11/2".

Boring tool will be stocked in grade C-2; other grades will be available upon request. A new form relief has been incorporated which enables resharpening in both planes, on the face and on the end. Highly lapped cutting edges afford greater tool life.

Atrax Co., 240 Day St., Newington, Conn.

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Air Transfer Operates at 8,000 RPM Speeds

Operating at shaft speeds to 8,000 rpm, rotary air transfer provides a pressure tight connection between a stationary unit and a rotating member.

With untreated compressor air, pressures range from 100 psi at 8,000 rpm to 135 psi at 4,500 rpm.

Sealol Corp., 23 Post Rd., Providence 5, R.I.

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MACHINE and TOOL BLUE BOOK

Wire Straightening and Cutting Machine

The Shuster 2AV variable speed automatic wire straightening and cutting machine cuts and straightens wire ranging in diameter from 1/16" to 5/16".

The machine features straightening arbor high speed type, with five elongated split-dies mounted on ball bearings for minimum vibration. Reeves variable speed units provide a choice of feed ranges from 50 to 200 fpm.



Mettler Machine Tool, Inc., Adeline and Boulevard, New Haven, Conn. Use postpaid card. Circle No. 142



PRESSES

STRAIGHT-SIDE TYPE

with large die area capacities up to 400 tons

AND
GAP
TYPE
PRESSES

Complete recommendations for any job on request



Press Brakes - Straight-Side-Type Presses - Press Brake Dies

Hand and Power Bending Brakes . Special Metal-Forming Machines

DREIS & KRUMP

MANUFACTURING CO.

7448 South Loomis Boulevard, Chicago 36, Illinois
Use postpoid cord. Circle No. 405

FREE REPRINTS

Reprints of certain articles which have appeared in past issues of the MACHINE and TOOL BLUE BOOK are available to our readers free of charge. Simply check those you wish to receive and mail to Hitchcock Publishing Co., Wheaton, Ill. They will be sent your way promptly.

- "Bouncing Ball" Method of Indication Inspects Irregular Cam Contours
- ☐ Can Powdered Metallurgy Save You Time and Money? Yes!—Here's How!
- ☐ Case Histories Calculate the "Dollar Wisdom" of Using Portable Air Tools
- ☐ Controls and Advanced Mechanism
- ☐ Die Head Threading and Chaser Sharpening
- ☐ Discharge Machining—Can it Save You Money?
- ☐ Flexible Reinforced Wheels
- ☐ Grinding Applications at Solar Aircraft
- ☐ How Chevrolet Produces Pinion Gears
- ☐ How Douglas Solved its Deep Hole Drilling Problems
- ☐ How to Get More and Better Holes from Your Twist Drills
- ☐ How Will We Shape the New Materials?
- ☐ Incentives—Good? Bad?
- ☐ More Beef—More Power for Precision Grinding
- ☐ More from Your High Production Machines

Press Brake Gives Large Die Area

A modified 30-ton capacity Chicago press brake is a standard machine for



producing light stampings. The machine is provided with wide bed and ram giving a die area of 36" x 77", has a stroke of 3", a speed of 40 strokes per minute, and is driven by a 3 hp motor.

Dreis & Krump Mfg. Co., 7400 So. Loomis Blvd., Chicago 36, Ill.

Use postpaid card, Circle No. 143



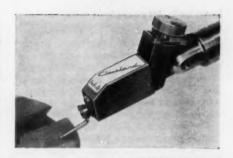
"Let's see . . . ice bag, bicarbonate and aspirin. Okay, Miss Cornstalk, bring in that report of the machine shop deficit now."

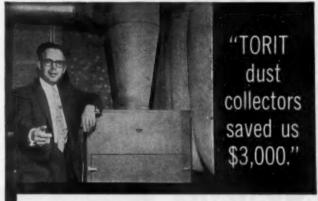
Tip Protects Gages

To overcome danger of damage to fragile high precision gage mechanisms, the protector gage tip was developed. The tip and the Cleveland INDI-AC electronic height gage are said to remain accurate to millionths of an inch.

The Cleveland Instrument Co., 735 Carnegie Ave., Cleveland 15, Ohio.

Use postpaid card. Circle No. 144





FREE BOOKLET shows you how to trap harmful dust better at less cost with TORIT.

Your plant can have the same initial savings and costcutting operation now enjoyed by the Sico Manufacturing Company, national producers of tables and seating equipment. Sico President, Kermit H. Wilson states, "... the lowest bid we had for a central dust collection system of minimum capacity was just under \$4,000. Our \$900 Torit installation has completely solved our dust problem and gives us greater flexibility than would be possible with a central system." There's a TORIT Collector to meet every type of dust problem, why not investigate?

FREE facts on TORIT DUST COLLECTORS that reduce maintenance costs, up production, improve employee morale. Write today to:

TORIT MANUFACTURING CO.

287 Walnut Street, St. Paul 2, Minn., Dept. 602

Impact Wrench

Impact wrench No. 777 includes improvements such as beryllium copper contacts and terminals, unit thrust bearings, chrome alloy steel balls and large planet gear pins in a new, three-planet system. It is suitable for automobile mechanics, service and maintenance men.

The wrench delivers 2,000 impacts a minute and develops 100 ft. lb. torque—

CAMS

To Your Specifications except Screw Machine Cams

Design Assistance Offered

KIDDE PRECISION TOOL CORP.
25 LOCUST AVE. ROSELAND, N.J.

Use postpaid card. Circle No. 407



Tamms Industries Co.

228 N. LaSalle St. • Chicago, III.
Use postpaid card. Circle No. 408



ample for running and removing nuts on bolts up to %".

List price is \$99.50 for wrench alone; \$128.00 for complete kit with carrying case, sockets, and accessories.

Millers Falls Co., Greenfield, Mass.

Use pestpaid eard, Circle No. 145

Larger Capacity Grinder

Boyar-Schultz No. 2 profile grinder is now available in a larger capacity size. With its 6-inch diameter wheel,



Larger profile grinder showing table tilted 10°.

MACHINE and TOOL BLUE BOOK

this new grinder will efficiently finish the largest dies and similar contour grinding jobs.

It is made in the single spindle model, with a larger table to accommodate larger and heavier work. Spindle turns at approximately 3450 rpm, oscillates at the rate of 75 per minute, 3/16" vertically.

Table tilts 10° front and back from horizontal. Table dimensions are 22" x 22". Vertical adjustment is 3-11/16".

Grinder can be equipped with dust collector.

Boyar-Schultz Corp., 2008 S. 25th Ave., Broadview, Ill.

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O-Ring Kit

So that the maintenance man will be able to have on hand at all times Orings in sizes usually required for emer-





VERTICAL

At last, a top quality industrial sander that provides all the most wanted \$89.95 features - yet sells for so little. \$9.95 complete-with cord, plug, switch ready to use

Illustrated Literature on Request
A few desirable distributor
territories still available.

WALLS SALES CORPORATION

Use postpaid card. Circle No. 410



GROB INC. Grafton, Wis.

Use postpoid card. Circle No. 411



Select-O-Ring kit No. 2 contains 180 O-rings.

gency or for planned replacement schedules, the Universal Select-O-Ring Kit No. 2 contains 180 O-rings in sizes from 1 to 25. These sizes, surveys show, are used on 70% of industrial equipment incorporating O-rings as sealing members.

The plastic case in which the rings are packed serves also as a gaging or measuring tool. O-rings are packed on pegs that duplicate the shafts on which the rings are to be used. A small gage molded into the side of the kit gives instant cross section measurement. By doubling the cross section thickness plus the known i.d., as shown on the peg, the result is the o.d. of the O-ring.

Interchange information of all leading producers of O-rings is supplied with each kit. All manufacturers' numbers are converted to the O-rings in the kit.

Bearings, Inc., 3634 Euclid Ave., Cleveland 15, O. Price \$24.50 each. Value of O-rings contained in the kit, if purchased separately, is \$50.

Use postpaid eard, Circle No. 147

Open Side Planer Provides Strength, Rigidity

The Young hydraulic open side planer is a heavy duty machine within ca-

pacity of its size and is claimed to incorporate features found in larger planers. It is available in sizes 30" to 48" and may be either hydraulic driven or reversing motor driven.

General characteristics of the Model 30-P are these: maximum planing width 36"; maximum distance under cross rail 35"; width of table 24" or 35"; maximum cutting load 8000 lb; cutting speed 0 to 110 fpm; return speed 160 fpm; stroke of all slides 10"; tool size 2" x



Model 30-P hydraulic driven planer. Pendant control allows control from both sides of the machine.

2"; rapid traverse all heads 50"; rapid traverse all slides 25".

The bed contains four oil tanks throughout its length. At the rear end of the bed is bolted a separate steel stand which contains the main drive motor and the hydraulic pump.

The rail head consists essentially of four tool bolts 34" dia. fastened into the tool apron, which has a lower lip which bears securely against the tool frame. This heavy tool frame is se-

NumberAll

TYPE HOLDERS

for stamping into Metal, etc.

Hand or Press, Type can be easily, quickly loaded. Simplest construction—sturdy pin holds type securely. No screws nor springs. Superquality steel type in various sizes 1/32" up to 1/2" figures and letters.

Write for Bulletin BB23H



NUMBERALL STAMP & TOOL CO.

Use postpaid card. Circle No. 412

YOST AIR POWER VISE does away with special and costly jig fixtures!

4-D Vise—DRILL PRESS

Yost air operated vises speed production and eliminate wasted time for manual clamping in drilling, milling and shaping operations. Replaceable steel jaws can be pre-set to any desired opening.

A complete control kit is included with each unit.

For whatever type of vise you need . . .

YOST MFG. CO.

124 Grant St.
Cambridge Springs, Penna., U.S.A.

Use postpaid card. Circle No. 413

May, 1958

MORRISON 1"

AUTOMATIC

KEYSEATER

Investigate the many features of this new Keyseater. It has automatic feed, automatic stop to cut off feed at given depth, automatic relief to back the work away from the cutter, automatic centering, a utomatic lubrication and no bushings required.

Write for more information on the finest Keyseater on the market.



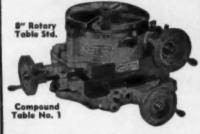
MORRISON CO.

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The STEVENS Line

SINCE 1925

Introducing NEW series



ROTARY TABLES, 5-8-12-15-18-24" sizes both stundard & dial indexing types. ADJUSTABLE TILTING TABLES, #1-2 COMPOUND TABLES, #1-2 ROTARY-COMPOUND TABLES #1-1½-2 INDEX CENTERS - multiple spindle

See your dealer or write for bulletins

The JOHN B. STEVENS Company SOMERSVILLE, CONN.

Use postpaid card. Circle No. 416



Assembly of rail head. Note heavy duty construction of slide and tool holder, also flexible hose to hydraulic tool lifter.

Try this Allman Universal Hand Tapper FREE for 15 days—

Results have proved that once this tapper is in your shop or tool-room and you find 70% of your free hand tapping time saved—

it will stay there! The new Allman hand tapper has these advantages:

- Articulate arm swings clear of large table for placement of work.
- Limitless number and sizes of tapped holes without moving work piece.
- Vise holds work as small as %" square
- Floating tap iocates itself in hole.
- Individual spindle helds taps, thus change requires enly seconds.



TOOLS,

1735 No. 25th Ave. . Melrose Park, III.

Use postpaid card. Circle No. 415

MACHINE and TOOL BLUE BOOK

curely pinned and bolted to the moving vertical slide. The fixed screw moves the vertical slide by means of a loading nut and bevel on a large ball bearing, all located in the swiveling index plate (±90°). All these parts are the same for the rail head and the side head. The only difference is in their saddle construction.

The rail head has over 36" of horizontal movement. The cross rail is clamped to the housing at any point vertically by means of a heavy steel brace.

Hydraulic table drive; Main drive motor is directly connected to hydraulic pump. Output of pump goes directly to four-way valve. One side of this valve is directed into the rear or cutting end of the table cylinder. Connected into this line with no outlet is an adjustable speed valve allowing

Speed Stamping Output with...

HYDRAULIC DRIVEN FEEDING AND STRAIGHTENING MACHINES



Smooth, powerful Littell No. 4 Series Rack and Pinion machines straighten coil stock up to .125" thick and feed it automatically to any type of punch press or square shear. They feed up to 16" lengths at standard speed, 40 SPM. Set in double cycle, they feed up to 32" lengths at 20 SPM. Used primarily in single station blanking or compound blanking and drawing operations. Also feed to multi-station dies where the final station location is by solid or disappearing stop. Easily moved about by fork truck. Write for Catalog Section "B".



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SPELLMACO "SPOTTERS"

A matched set of transfer punches for toolmakers, machinists & tool cribs

Used for transferring location of threaded, drilled and reamed holes, slugs, blanks, etc.

made of finest tool steel-Carefully heat treated and tempered for long life-...0025 undersize to facilitate use-Black exide finish Set #3-17, 28 punches with indexed stand—sizes 3/32" to 1/2", by 1/64"— plus handy 17/32" size, Length 4%" ONLY \$17.36 Single sizes available

L. SPELLMAN CO. - URBANA, OHIO

Use postpaid card. Ciricle No. 418

rapid flow one direction and slow flow the opposite direction. Constant pressure is also used to operate the tool lifter, feed cylinder and the cross rail clamping cylinder.

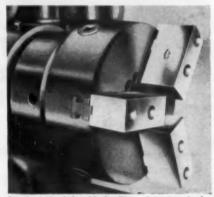
A feed box located on the end of the cross rail drives the cross head. and a second feed box on the end of the side head drives the side head. Each feed box consists of two power drives.

Young Machine Tool Div., Young Testing Machine Co., Church Rd., Bridgeport, Pa.

Use postpaid card, Circle No. 148

Chuck Jaw Blanks

A new line of standard chuck jaw blanks is being mass-produced in standard sizes to fit approximately 90% of all master chucks. Precision machined to S.A.E. 1020 steel, blanks can be formed to hold all types of irregularly shaped workpieces. They can be machined to fit the most exacting hold-



Standard chuck jaw blanks fit most master chucks.

ing requirements without marring work surfaces and with no need of special face plates or fixtures, the manufacturer claims.

Jergens Tool Specialty Co., 712 E. 163 St., Cleveland 10, Ohio.

Use postpaid eard, Circle No. 149



ROTARY BUSHINGS FOR DRILLING, CORE DRILLING ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting and tool accurately below as above the work—or both.

Eliminates expensive tool construction—Reduces tool wear-Prevents seizure and pilot breakage-Especially adapted where precision is required. Write for full information and prices

Use postpaid Card. Circle No. 419

NOW . . . SET UP COMPOUND ANGLES INSTANTLY

Save time and money with this Master Multi-Swivel Vise. And you can often save the cost of an expensive jig or fixture! Investigate the money and time saving possibilities by writing today for free illustrated folder.

DONOVAN MFG. CO.

80 Batterymarch St.

Boston 10, Mass



Use postpaid card, Circle No. 420

Grinder Has Electro-Magnetic Power Transmission

A 12" swing by 30" table travel completely universal grinder has table feeds between 3" and 50" per minute readily available, by means of an infinitely variable speed drive motor, according to the announcement. The same type of drive motor claims workhead rotational speeds of 20 to 450 rpm.

Table reversal is by means of an electromagnetic double clutch.

which makes possible immediate transfer from power to hand feed. Internal or external generation of angles is accomplished by setting the spindle



mounting bracket to the desired angle, and then actuating the in-feed control.

Parker-Majestic, Inc., 147 Jos. Campau, Detroit 7, Mich.

Use postpaid card, Circle No. 150



for - - ASSEMBLING • FORMING
BROACHING • MOLDING
STRAIGHTENING. 1½ to 75 Tons

GREENERD ARBOR PRESS CO.

Listed in Sweet's Machine Tool Cat. or Write Today for Catalog No. 556.



Use postpaid card. Circle No. 421

Mist Coolant Units

The mist coolant units are quickly adaptable for central systems where a single source of coolant for a group of machines is desired.

The coolant manifolds, each for either one or two outlets, are connected directly to piping or tubing. The coolant is delivered to the pipe through gravity. a low pressure supply pump, or any other method that keeps the line filled. Both air flow and fluid flow are controlled individually even though the



central coolant supply is at uniform pressure.

Graymills Corp., 3705 N. Lincoln, Chicago 13, Ill.

Use postpaid card, Circle No. 151

Distributors Attention! Get the Details On A Valuable **Franchise**

At the

Tool

Show

Booth 747





• Designed to overcome three major clamping problems . . . time consuming . . . bolt stripping waste . . . and unsafe set-ups. • All component parts stay integral—NO LOOSE PIECES • All parts are steel forging, heat treated for maximum toughness . Serrated bolt and step block adjustment design provides rigid, parallel clamping for safe set-ups

Ask about FREE demanstration . . . Hi-Lo Kits . . . and full particulars.



Hi-Lo PRODUCTS COMPANY

BASE

Div. of Steel City Tosting Machines, Inc. 8825 Lyndon Ave., Detroit 38, Mich.

Use postpaid card. Circle No. 422

MACHINE and TOOL BLUE BOOK



SAVE 50% of positioning time

With one set-up on a Cincinnati Gilbert universal table, you can drill at any angle up to 90° on 5 sides of a cube. Provides maximum support of work piece, assures rigidity and accuracy. Table sizes: 22" and 27" square, 22" high. For complete details and specs, ask for Bulletin 850.

THE CINCINNATI GILBERT MACHINE TOOL COMPANY . CINCINNATI 23. OHIO

Use postpaid card. Circle No. 423

Bar Feed Attachment Increases Production

Lipe automatic magazine loading bar feeds are now available for all Screwmatic 750 machines. The unit holds an eight-hour supply of bars, rods, or tubing and is pneumatically controlled, eliminating feed fingers and manual loading. It also reduces operator fatigue, has

greater volume per machine, and holds tolerances of plus or minus .001".

An agreement with the manufacturers, Lipe-Rollway Corp., of Syracuse, N.Y., will permit Gear Grinding Machine Co. to install, service, and maintain the units on Screwmatic 750s.

Gear Grinding Machine Co., 3901 Christopher, Detroit 11, Mich.

Use postpaid eard, Circle No. 152



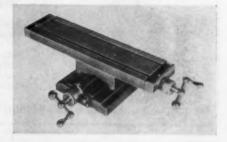


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Compound Table

The ATECO compound table, designed to produce holes in drill-jig plates and similar work, consists of workbed capable of being adjusted in two directions at right angles to each other and is intended for attachment to an accurate drilling machine. Movements are controlled by leadscrews of accurate pitch, fitted with micrometer collars reading in increments of 0.001", a



INCREASE YOUR PRODUCTION EFFICIENCY!



The most complete, most modern line of magnetic chucks, with the most permanent magnets ever produced. The ceramic magnets have many times the coercive force of alloy magnets. The face is all steel, with no soft insulating material. Check these important advantages:—

- Weight is 50% less than conventional permanent chucks; minimizes reciprocating table inertia
- Low, low height gives greater-than-ever machine capacity
- Fine pole divisions give maximum holding power
- All magnetic fields are controlled to prevent magnetization of machine tables or ways
- Solid silver-brazed construction for true dimensional stability
- Uniform holding throughout

New Catalog gives comprehensive descriptions and specifications of the complete O. S. Walker line of permanent and electro magnetic chucks. Send for your FREE copy today!



* Patent applied for

O. S. WALKER COMPANY, INC.

WORCESTER 6, MASSACHUSETTS, U. S. A.

Use postpaid card. Circle No. 426

greater degree of accuracy than 0.002" being obtainable, according to the announcement.

Air Transport Equipment, Inc., Amityville, N.Y.

Use postpaid eard, Circle No. 153

Die Filing Machine

Small bench-type die filer, for filing and sawing small dies, jigs and templates, features a tilting table. Unit uses standard 3½" or 4" parallel machine files as small as 3/64" in diameter.

Accuracy in operation is claimed to be assured by a rigid mounting design in the yoke holding the files. The yoke itself reciprocates on two hardened steel rods traveling in guides.

Specifications: 6" dia. table; 1" stroke, 3½" throat; 1½" work thickness capacity. Filer operates with a ¼ hp electric motor at a speed of 375 strokes



STYLE AND SIZES FOR ALL MACHINES ON WHICH THREADS ARE CUT

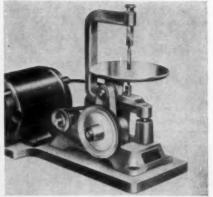
This die head is unique

THERE IS NO OTHER LIKE IT

It cuts threads with insert chasers. These are, in reality, small sections of the business end of large and expensive chasers, but with this important difference their cost is so low they can be even thrown away when dull. For example, for less than \$50 you can get a dozen sets of insert chasers, each set ground ready to go. Change now to insert chaser die heads and watch your performance improve. "UNIFIED AND AMERICAN SCREW THREAD DIGEST" sent free on request.

THE EASTERN MACHINE SCREW CORP., 25-45 Barclay St., New Haven, Conn.
Use postpoid card. Circle No. 427





High Speed filer for small dies, Jigs, templates.

per minute. It is priced at \$165 with motor, \$150 without motor.

High Speed Hammer Co., Rochester, N.Y.

Use postpaid eard. Circle No. 154

Milling Cutters

Inserted blade shell end mills and face mills, utilizing ½" and ¾" square standard throw-away carbide inserts, are being produced initially with double negative rake angles. A hardened high speed steel anvil is located in back of the cutting insert.

Generous chip room is provided along with close blade spacing to provide high feed rates.

Viking Tool Co., 1000 Nichols Rd., P.O. Box 471, Shelton, Conn.

Use postpaid eard. Circle No. 155



Use postpaid card. Circle No. 428

Accessories Broaden Production of Metal Lathes

A double tool post cross slide, featuring an exclusive new pilot wheel feed, tops a list of new accessories for standard Delta 11-inch metalworking lathes. The slide makes possible universal tool positioning. Used with a bed turret, it converts the lathe into a sixtation turret lathe or hand screw machine.

Also available for the lathe is a lever-type, ball-bearing collet

closer, and special gear train and splash guards are also new additions.

Delta Power Tool Div., Rockwell Mfg. Co., 481 N. Lexington Ave., Pittsburgh 8, Pa.

Use postpaid eard, Circle No. 156



Impulse Counter

Granting of the first license for the use of the patented Toolitrol impulse counter is announced by the manufacturer.

An advantage of the counter is that it is directly connected to the machine and operates from electrical impulses, making it impossible for the counter to keep running if the machine is not actually cycling. Actual work produced is the determining factor used to establish tool use.

Scully-Jones and Co., 1901 So. Rock-well St., Chicago, Ill.

Use postpaid card, Circle No. 157





Use postpaid card. Circle No. 430



AIR GRINDERS

MODEL JA
50,000 R.P.M.
\$4200
IN U.S.A.

Weight 12 ounces; length 6½ inches; chuck size ½ inch. Wheel guard removed for better illustration.

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work—longer wheel life.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.



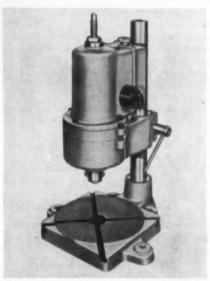
MADISON-KIPP CORP.

207 Waubesa St., Madison IO, Wis., U.S.A.

Use postpaid card. Circle No. 431

Bench Type Press Powered by Electromagnetism

The McCauley electromagnetic high speed press is designed to accurately perform a wide range of operations. Stroke adjustment permits a choice of



Electromagnetic press—for punching, jolting, drawing, bending, riveting, cutting, stamping.

single stroke operation or of multiple stroke operation over a range of 10 to 200 strokes per minute. Force of impact can be adjusted from 600 lb. to 3½ tons.

As its name implies, the power unit is an electromagnet—a movable iron core traveling within the magnet acts as a ram. This type of construction eliminates the use of moving parts subject to mechanical wear and fatigue stresses.

McCauley Industrial Corp., 1840 Howell Ave., Dayton 7, Ohio.

Use postpaid card, Circle No. 158

MACHINE and TOOL BLUE BOOK

Borer Gives Quality Finish

A large capacity Hydro-Borer, Model S-7, for boring large assemblies or small individual pieces, bores to close tolerances with a good quality finish because of the patented feed principle. It is specifically designed for mounting on workholding fixtures or large assembly jigs.

The Hydro-Borer is very compact for







AMES PORTABLE HARDNESS TESTERS

Read directly in all Rockwell scales. No skill required to get accurate readings. Bars, sheets, tubing, various odd-shaped parts and frames—test them where they are, without cutting off samples.

Send For Bulletins

SEMA CORPORATION BOSTON 72, MASS., U.S.A.

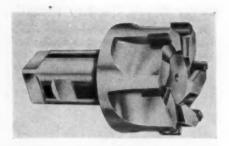
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its heavy feed capacity. Feed per revolution is .0035" reducible to .002". RPM ranges are 465, 900, and 1400. It can be equipped with manual, solenoid, or air-operated controls.

Greenlee Bros. & Co., Rockford, Ill.

Carbide Face Mill

A one-piece face mill has a straight shank designed with fine pitch thread so adjustable stop can be pre-set for



Gain the economies of

AUTOMATION!



FEDERAL PLAN PRESSES

33 Years' Experience In Dial Feed Engineering and Construction

Use postpoid card. Circle No. 433

depth of cut. It is primarily designed for use in automation equipment where positive and repetitive location is required.

The square end shank also has the added feature of set-screw flats, making it possible to mount it in the standard 50-2 straight shank adapter.

The Nelco cutter tips are solid carbide, sandwich brazed to steel body with

integral straight steel shank with 45° chamfer.

Nelco Tool Co., Inc., Manchester,

Use postpaid card, Circle No. 160

Vacuum Lifts

Latest model in the Vac-U-Mation heavy duty series of vacuum lifts is the No. 12651, a self-contained power tilt, 4-cup lifter with 2,000 lb. capacity. Cups are automatically rotated to ver-



BETTER WAY TO CLEAN



GRAYMILLS AGITOR Parts Washer

1. No heating, no vapor

Flush chips and dirt from metal parts with filtered solvent

3. Clean out blind holes and cavities

 Do it thoroughly, fast and safely Send for catalog and prices

152

GRAYMILLS CORP. Chicago 13, III.

Use postpaid card. Circle No. 435



Our quantity production of standard-size, precision, stainless-steel pins is now expanded to miniature pins. Tolerances are held to .0002 on dia. Sizes run as small as .020 dia. x ½,6". Both straight and taper styles are produced, with taper pins ranging down to 9/0. We specialize on stainless-steel, instrument-type pins. Send your blue-prints for prompt quotation.

THE PEASLEE METAL PRODUCTS CO.
470 Tolland Street ◆ East Hartford 8, Conr
Use postpoid card. Circle No. 436



tical or horizontal positions, eliminating maneuvering by operation.

Sheet or plate can be handled by crane for warehouse or storage stacking, while free suspension permits positioning by operator for press or other machining operations in line production.

The guiding flexible handle is ratchet controlled for positioning at various heights as lifter is raised or lowered.

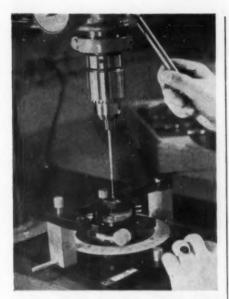
Interlocking safety checks insure fail-safe rotation both electrically and mechanically, according to the announcement.

Vac-U-Mation Div., F. J. Littell Machine Co., 4555 N. Ravenswood Ave., Chicago 40, Ill.

Use postpaid card, Circle No. 161

Drill Head for Small Mechanisms

The Mindrill, for accurate drilling of small holes, is constructed with a special gripping mechanism which permits quick, easy changing of dull or broken drills. This eliminates the need for costly, time consuming soldering and brazing, according to the announce-



ment. Used to drill tiny, closely spaced tap holes in the potentiometers manufactured by Micro-Lectric Div. of Micro Machine Works, Inc., the tool is designed for precision drilling of instrument parts, on all types of small, intricate mechanisms including watches and clocks, for the fashioning of silver, copper, or gold jewelry and for close center distances.

Ritmar Corp., Huntington, L.I., N.Y.
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Numerically Controlled Knee Type Milling Machines

Engineered specifically for 3-D milling of small and medium sized workpieces of both ferrous and nonferrous metals, three standard knee-type vertical milling machines are now available for numerically controlled operation.

The three KTNC (Kearney & Trecker Numerical Control) models, are the 5 hp Model 2CH-KTNC with 16 spindle speeds ranging from 25 to 1500 rpm,



Stainless steel and carome finish at much lower cost! 37/6" x 51/4" solid hardened ground and lapped base that prevents tilting and toppling; Rigid stainless steel column, 5/16" x 11/4" section; Easy reading, no glare, satin chrome finish Vernier and scale; Extra large Vernier, 2.450"; Tungsten carbide tipped scriber. Available in two models, 18" and 24". You will like the quality, easy reading and price—Write today for complete details.

BOREL & DUNNER

19313 Farmington Road, Livonia, Michigan

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Gut Drill Gosts!

Eliminate expensive "outside" sharpening or time-costly "hand-sharpening"! BLACK DIAMOND (up to 34" Drills) or WORCESTER (up to 2½" Drills) DRILL GRINDERS are always set up to sharpen 1 or 100 drills ochange sizes in seconds. Your most inexperienced man (or woman) can easily restore like-new sharpness to dull drills in ten seconds, and pay for your unit in months!



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A Radically Different System For Grinding Twist Drills, Counterbores, Etc.

The CAWI

for regular, crankshaft, and also spiral point drills



"CAWI" Spiral . . . grinds many other two, three and four-fluted tools for drilling milling and countersinking. In grinding tools the lips come in contact with the grind-

ing wheel alternately, thus assuring greater uniformity and accuracy.

Capacity: 1/32" to 2" diameter, from 0° to 180° included angle.

Specialty: Crankshaft-point drills.

See our latest model, Booth 972 A.S.T.E. Show, Philadelphia.

CAWI MACHINE CO., INC.
34 EXCHANGE PLACE JERSEY CITY 2, N.J.

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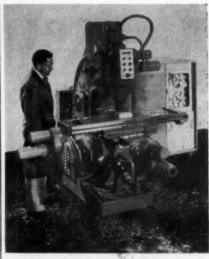
COLD CUT... Solid Stock Tubes, Pipes Sections of Steel, Non-Ferrous Metals, etc. accurately—economically on



"ULMIA" CIRCULAR SAWING MACHINES
Factory Sales Office:

ALWIN FR. WILKENS, INC. 55-02 37th Avenue Woodside 77, New York

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2CH-KTNC with ECS-Digimatic control system.

and two heavy-duty 15 hp models, the 315TF-KTNC and the 415TF-KTNC, each with twin elevating screws and 24 spindle speeds ranging from 15 to 1500 rpm.

Three control systems are available: Bendix, GE, and ECS-Digimatic. Proper selection of a particular control system will be determined by the job to be done, the price, and the computor facilities available.

Kearney & Trecker, 6784 W. National Ave., Milwaukee 14, Wis.

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CAM MILLING

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

HIMOFF MACHINE CO. INC. 23-22 44th Road Long Island City 1 N Y

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MACHINE and TOOL BLUE BOOK

Drill Test Microscope

Twist drills from 1/16" to 7/16" in diameter may be tested on the German Titex microscope, which has two optics. The larger lens checks the concentricity of the chisel edge, while the smaller one checks the point angle and a normal relief angle of six degrees.

W. von Arnauld Co., 95 Grove St., Oakland, N.J.

Use mostpaid eard, Circle No. 164



German-made test microscope has two optics.



Optional SWIVEL BASE converts a conventional dividing head into a universal work head or rotary table. Change-over is accomplished in seconds without tools or wrenches.

Also available in 10" - 12" sizes and in 10"

spiral drive.

Write for Catalog

CARROLL DIVIDING HEAD CO. 3525 Cardiff Ave. . Cincinnati 9, Ohio

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SPECIFY TOP QUALITY



ARBOR SPACERS SHIMS and SPACING COLLARS • Arbor

Spacers and Shims in 20 sizes and thicknesses from .001" to .125". Arbor Spacers furnished with standard keyway; Shims, with no keyway. Also Spacing Collars in numerous popular diameters, and in thicknesses from 1/4" to 3". Hardened and ground; edges chamfered. Furnished with standard keyway.

FEELER STOCK .

Made from tempered stock, rolled to close tolerances, 1/2" x 25' coils packaged in transparent plastic boxes, except above .020". Strips 1/2" x 12", in cellophane. 27 thicknesses. All thicknesses from .001" to .032". (For use in precision fitting, checking clearances, inspection and production work.)

SHIM STOCK .

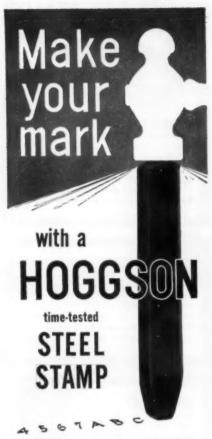
Steel or brass. Selected from material rolled to precision limits, free from burrs, and protected by oil coating. Coils packed in carton for easy dispensing and protection. 15 thicknesses, .001" to .032". Sheets 6" x 12"; coils 6" x 120". Available also in two assortment packages-12 thicknesses, .001" to .015", and 15 thicknesses, .001 to .032".

WRITE FOR **illustrated Brochu** and Price List!



DETROIT STAMPING CO.

347 MIDLAND AVE. . DETROIT 3, MICH. Use postpaid card. Circle No. 443



Hoggson stamps are made of finest alloy steel, heat treated to stand continuous impact without breakage of face or mushrooming of body. Available for marking letters, figures or symbols on almost any metal, plastic, or wooden product, Any style letter or figure in face sizes from \%2" to \%2".

Write us for information, or see your nearest mill supply.

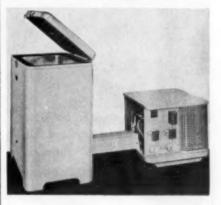
HOGGSON & PETTIS MFG. CO.

141H Brewery St. New Haven, Conn.
Use postpoid card. Circle No. 444

Sub-Zero Unit Has Remote Power Pack

A 5 cu. ft. mechanical low-temperature metal curing unit with remote power pack has been developed for the Sperry Gyroscope Co. This machine is used for temperature-cycling of critical initial guidance components for missiles and aircraft systems at the Great Neck, N.Y., Sperry plant.

The new SV-70-5-R model is connected to the refrigeration power pack



by a 2-ft. length of insulated 6" x 6" duct. In a through-the-wall arrangement, the refrigeration chamber is isolated and is controlled by the operator from the adjoining room. The temperature range, factory set at minus 70° F., is adjustable from minus 10° to minus 70° F. Net thermal capacity is approximately 500 BTU per hour at minus 70° F. It incorporates a built-in thermal overload and under-voltage protection and has a sealed-in life-time oil supply.

Model SV-70-5-R is suited for use in many types of production chilling operations. The built-in system of temperature adjustment, with rapid pulldown from ambient to minus 70° offers

the versatility and speed vital to modern high standards.

Cincinnati Sub-Zero Products, 3930 Reading Rd., Cincinnati 29, Ohio.

Use postpaid card, Circle No. 165

Quick Lock Vise

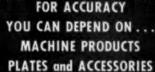
Designed for production drilling, tapping, and assembly, the Palmgren No. 32 quick lock vise locks quickly and positively with the Palmgren cam



and "Y" lock mechanism. The vise has no screw to be damaged by wear or breakage. Bearing and locking surfaces



Black Granite Plates



YOU CAN DEPEND ON . . .



Cast Iron Plates





Layout Plates

Surface Plates - most complete line offered anywhere. Sizes to meet every need, your choice of material . . . super-smooth, wear-resistant black granite or rugged, precisionsurfaced cast iron.

Stands - available in sizes for all Machine Products surface plates in two styles . . . as shown, or pedestal type for larger, heavy duty plates.

Layout Plates-designed for layout, inspection or machining operations. Standard sizes available for immediate shipment . . . special sizes on request.

No need for another source for measuring accessories, either, because Machine Products can supply angle plates, vee blocks, parallels . . . whatever you need. Send for your free catalog today.

KNOBS . HANDLES LEVERS . WHEELS









Available from stock in styles and sizes to meet most every need. Also, "specials" in sizes and materials to your specifications.

FREE CATALOG



are hardened for long service.

Only a flick of the locking lever is necessary to release the quick lock, and the movable jaw slides easily to any position. It has 2\%" jaw width, 1\%" jaw opening, 1\%" jaw depth.

Chicago Tool and Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.

Square Gage Blocks Introduced

This line of square type gage blocks, both chrome carbide and standard steel, is designed for interchangeability with all other square gage blocks. The new blocks are .950" square with an approximate 1/4" hole for tie rods. They are produced in a complete range of sizes,

BEW SAMPLER

Brings Typical Spot & Center Drills and Adapters for you to shop-test without obligation



You can't fully appreciate the convenience, low cost and time saving advantages of these tools until you try them. That's why we're making it easy for you to do so—at your convenience. Return the sampler after your evaluation—using label and postage enclosed. Any tools you may wish to retain will be billed later.

B & W PRECISION PRODUCTS CO.

11393 E. Eight Mile Road, P. O. Box 3865 Detroit 5, Michigan, Engineering Dept. B. Use postpaid card. Circle No. 446



Webber blocks-sets of 34, 36, 81, 84, 85, 88.

available as individual or replacement blocks or in sets of 34, 36, 81, 84, 85 and 88 blocks. Accuracies are standard A or B.

Square chrome carbide wear blocks in .050" and .100" sizes, and all standard accessories including tie rods, half round jaws, straight jaws, scriber points and triangular base blocks are also furnished.

Webber Gage Co., 12912 Triskett Rd., Cleveland 11, Ohio.

Use postpaid card. Circle No. 167



SPEEDY-SAFE NON-POISONOUS

CASE HARDENING

Indispensable for Too' Rooms, Machine Shops Schools, etc. Now avail able in 1, 5, 10, 25, 50 and 100 lb. containers Write for Details

KASENIT CO. 1 King St., Mahwah, N.J.

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May, 1958



ARE PRODUCED BY

Wm. H. Ottemiller Co. YORK, PENNA. Precision Milled Specials? Of Course!

Precision Milled Specials? Of Course!

We'll be glad to quote on yours — promotly

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BIN UNITS BENCH or FLOOR

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ASSEMBLY ASSEMBLY

OF SMALL PARTS





BENCH MODELS

FIVE SIZES
of removable
BIN BOXES

Visible parts handling saves time and money!

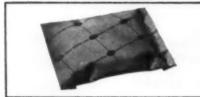
FLOOR MODELS DEALERS IN PRINCIPAL CITIES

BATHEY MFG. CO.

100 5 MILL STREET PLYMOUTH, MICH



JIFFY PADDED SHIPPING BAGS for Your Product

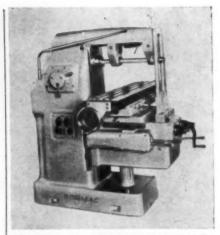


- → SPEED_Nine seconds is all it takes to pack a product for shipment. Insert item—staple or tape. It's ready to go!
- → PROTECTION—Thickly cushioned, inexpensive Jiffy Bag is all the protection your product needs. It takes the place of boxes, fillers, overwraps.
- ➤ ECONOMY—You can save up to 76% packing time by switching to JIFFY BAGS. Eliminate overtime. Meet delivery schedules with money-saving. time-saving JIFFY BAGS.

Write today for samples and prices.

JIFFY MANUFACTURING CO.

376 FLORENCE AVE., HILLSIDE, N. J.



Universal Milling Machine

The Dormac high speed, dial type, universal milling machine features hardened and ground gears, hardened and ground spindle, power feeds, and power rapid traverse.

Specs. are: table sizes either 12" x 51" or 12" x 60"; No. 50 national standard taper spindle, 12 speeds, 27 to 1540 rpm; 12 feeds.

Index Industrial Corp., 150 Broadway, New York 38, N.Y.

Use postpaid card, Circle No. 168



show his authority."

Cuts the FASTEST and FINEST NOTCHES Ever Made!

ARGSNUG

Combines to give you the snuggest fitting, angular tubing joints for cheaper, quicker, easier welding.

ARC-SNUG gives you clean-edge, closefitting, true contour notching by making both the first and second cuts of the notch in a single downstroke of the press. Notches 1/2" to 114" O.D. metal tubing (16 gauge and under) at angles ranging from

35 to 90 degrees. Special sizes and special dies to cut stainless steel, Monel metal, etc., made to order. Dies for various angles and sizes are interchangeable. Write FURNISHED for literature.

NOTCHED SAMPLES GLADLY

VOGEL TOOL & DIE CORPORATION

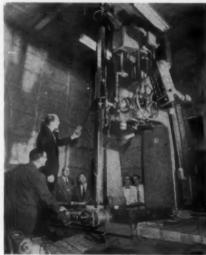
1825 NORTH 32ND AVENUE MELROSE PARK, ILLINOIS

Use postpaid card. Circle No. 451

Precision Jig Borer

A new type precision jig borer that incorporates a built-in gaging device, especially designed to solve a complex machining and gaging problem in connection with the production of nuclear reactors, has been announced by Pratt & Whitney Co., West Hartford, Conn. Units of this machine, which is capable of performing drilling, boring, and milling operations to an accuracy of one ten-thousandth of an inch, have been delivered to several prominent manufacturers of nuclear reactors, the company said.

The reactor component for which the jig borer was designed is a massive metal part into which slots more than 5' deep have been machined. The built-in gage determines the locations of the full-length free paths within these slots relative to a fixed reference point on the work surface.



Jig borer with built-in gaging device.

The specially engineered probe bar used to locate the free paths in the

ACCURACY at a PRICE

(YOU CAN'T AFFORD TO BE WITHOUT)

(YOU CAN AFFORD)



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MACHINE and TOOL BLUE BOOK

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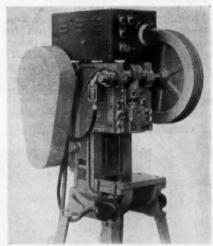
WHEATON, ILLINOIS

slots is mounted on the side of the column and power feeds up and down in a special bearing mount. This mount incorporates 3 positive and 6 adjustable bearing rolls ground accurate to .00002". Use postpaid card, Circle No. 169

8-Ton Punch Press Made Ultra-Safe

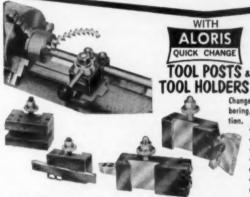
An 8-ton electro-safe punch press has a special high-starting torque motor which delivers power directly to the crankshaft, which eliminates flywheelin-motion and clutching mechanism hazards. A safety stop switch in the control panel enables any type of mechanical or electrical detectors to stop the ram immediately if imperfect feeding or stamping is detected.

The press has proved effective in trimming, forming, drawing, embossing, coining, staking, and assembly, Two models are available-standard OBI.



and 1234" deep throat. Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Calif. Use postpaid eard, Circle No. 170

YOUR LATHES "TURN OUT" BIGGER PROFITS





Change tools instantly - for turning, facing, drilling, boring, threading, knorling, cutting off or any opera-

- Maximum Repetitive Accuracy Assured
- No Shims . . . No Time Wasted
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- Saves 90% Set-up Time, 50% Production Time
- · Greater Rigidity
- · Leading Lathe Mfrs. Recommend It
- · Sizes to Fit Every Lathe

Unconditionally Guaranteed

Aloris Holder for Carbide Triangular Inserts. Greater rigidity, versatility, efficiency & economy

Write For Catalog & Price List

ALORIS TOOL CO., INC. Clifton, New Jersey

Plastic Bar Stock Is Corrosion Resistant

Rigid polyvinyl chloride industrial plastic is available in bar form for automatic screw machine production of corrosion resistant parts. Called Ryertex-Omicron PVC, it is said to machine like brass, using both ordinary carbon steel and high speed cutting tools.

Bar sizes in stock range from 1/4"



rounds to 2", in 10' lengths. Larger sizes may be secured to 20' long. Tolerances through 1" size are ±.005";



Reversible Thread Plug Adapter

Cut Thread Gaging Costs with Taft-Peirce Rotochek®



Taper Lock Plugs Mount in tapered sleeves

Mechanize your Thread Gaging with Taft-Peirce Rotochek. Takes A.G.D. standard thread plug (taper shank and reversible), and thread ring gages. Rotochek is also adaptable to many special thread gaging problems. Call on Taft-Peirce for advice.

Push! Pull! And the part is inspected! Thread gaging is as simple as that when you mechanize with the Taft-Peirce Rotochek. It's fast, accurate and easy to use . . . actually makes it possible to triple your thread inspection rate, increase sampling, or perform 100% parts inspection - without sacrificing quality or adding manpower.

Available in bench and flexible shaft models. A slight push and the gage rotates in, release pressure and Rotochek stops, pull and it disengages. Special clutch-controlled power does all the work.

Want more information? This is your opportunity to take a real cost-saving look at your gaging operation. Send for Bulletin #612 with complete description and prices.

TAKE IT TO

TAFT-PEIRCE



WOONSOCKET, RHODE ISLAND

over 1" through 2", ±.010"; and over 2", ±.015", according to the announcement.

Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. Use postpaid card. Circle No. 171

1" Micrometer

An outside 1" capacity micrometer caliper has frame specially forged and ribbed for extra strength and which tapers to the anvil to permit use in



narrow slots and tight places.

The No. 436 micrometer is furnished

New, Lightweight, Powerful FLEXIBLE TOOL SHAFT

Connects To Any Motor



Stow flexible tool shafts increase precision, eliminate operator fatigue on production grinding, polishing, sanding and other finishing operations in which the operator must hold the tool for long periods of time. Up to 3 HP can be transmitted through these new tool shafts, which consist of a core made of highest grade music wire rotating inside a rubber-covered casing. Each shaft furnished with ball bearing motor connection and high-speed ball bearing handpiece with removable wheel Arbor having ½20" threads. An anele head can be used in place of the handpiece as shown in the photograph. Four Sizes of these shafts are available . . models 38, 40, 50 and 63, which come in 6-foot standard lengths. The largest shaft, model 63, will handle 3 HP at speeds up to 6900 RPM and has a maximum capacity for various accessories as follows: grinding wheel, 8" x 1"; buffing wheel, 8" x 1"; sanding disc, 9" diameter; sanding drum, 6" x 2½"; wire brush, 8" x 2"; steel drills, ½" diameter.

Write for Catalog 57

STOW MANUFACTURING CO.

30 Shear St.

Binghamton, New York

.004" TO 5 32 HOLES DRILLED



NEW Planetary Micro-Feed

SPEEDS PRODUCTION
REDUCES BREAKAGE

Planetary Micro-Feed provides 4:1 ratio for very fine quill feed of drills down to .004". Standard feed for drills No. 60 to 5/32". Variable speed control 1,000 to 10,000 or 2,500 to 15,000 RPM. Direct drive motor spindle.

The ELECTRO-MECHANO CO.
263 E. Erie St. Milwaukee 2, Wis.

with or without a lock nut. It is also available at additional cost with a ratchet stop at end of thimble or with friction control built into the thimble, and come in sizes up to 9" with solid frame and from 10" to 24" with perforated frame.

L. S. Starrett Co., Athol, Mass.
Use postpaid card. Circle No. 172

Wire and Tube Marking Machine

An electric keyboard-operated wire and tube marking machine, to speed the marking operation, will brand various sizes of tubing or wire with a touch of the keyboard. As information is typed, the wire is fed into the machine





"What do you mean, 'Put on the coffee'?
I'm BACK from work."

and spaced, giving clear, clean marks.

The thermostatically controlled branding head may be set to temperatures as high as 800°.

Guides will take tubing from 1/16" dia. to over ½" dia., and wire of 18 gauge and greater.

Defiance Machine & Tool Co., 1920 S. Vandeventer Ave., St. Louis 10, Mo.

Use postpaid card, Circle No. 173

Tube Bending Machine Saves Floor Space

This new tube bending machine requires a floor space area of only 32" x 72". It can be adapted to make as many as four bends simultaneously, running at a speed of 600-800 cycles per hour (hydraulic and semi-automatic).

Pictured here is the Model 500-C



Now Available ...

Miccro Supreme Spray

LAY-OUT DYE (Purple)



A new, easy-to-use, dependable, spray Lay-Out Dye for tool, die, pattern, or template layout on metal. Dries instantly—shows up in sharp relief.

Also Still Available...

Mifero Jupreme

LAY-OUT AND IDENTIFICATION DYE (7 Colors)



For layout on metal and quick identification of bar stock, sheets, strips, or parts. Also dries instantly and shows up in sharp relief. Available in brush-incap cans and larger containers.

Write for circular on company letterhead.

MICHIGAN CHROME & CHEMICAL COMPANY

8615 Grinnell Ave. . Detroit 13, Mich.

Use postpaid card. Circle No. 458



showing an operation which makes both of the large sweeping bends of the rear frame of a chair simultaneously.

Spencer Tool & Mfg. Co., 4343 S. Kilpatrick Ave., Chicago 32, Ill.

Use postpaid card, Circle No. 174



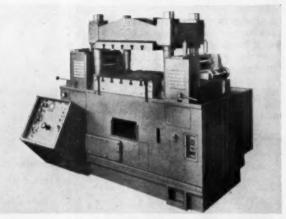
"Just a minute . . . let me scribble that number down."

Stamping Presses

Two point, back gear, under drive stamping presses, called Alpha. are available in four standard models: in 75 ton, in 100 ton, in 150 ton, and in 200 ton capacities. The precision presses are said to give high-speed, precision operation, long, troublefree service, and, longer die life.

The four models feature great alignment and guiding surface area, including a four post guide to the upper

platen, insuring precision alignment of punch and die, throughout the stroke of the press, according to the announcement. And, capacity point loading can be handled anywhere along the center



line of the press, right to left, and columns to columns.

No pits are required with the presses. Alpha Press & Machine, Inc., 9281 Freeland Ave., Detroit 28, Mich.

Use postpaid card, Circle No. 175





MASTER MULTI TOOLHOLDER "BONI"

- Clamp with guaranteed assuracy of .0001"
 Adjust Cutters to proper height easily and quickly
 Make unlimited teel changes and operations
 with different teels
 Save considerable set-up time—up to 90%—In
 individual as well as production work

MODERNIZE YOUR LATHES! PRODUCE MORE WITH GREATER PRECISION! Five sizes available for senter heights from 4" to 18" Sole U.S.A. Representatives;



KARL A. NEISE 404 4th Ave., Dept. MT New York 16, N. Y.

Round Broaches

Round, push-type broaches are said to give greater speed, convenience, and economy in making round holes which must be held to close tolerances, and must be perfectly straight all the way through.

Originally developed to meet the aircraft industry's precision requirements. the broaches can be used with the shop arbor press or hydraulic press.

BURR KEYSEATERS



They eliminate chatter marks, rings and run-out, and finish to exact size in one

The duMont Corp., Greenfield, Mass.
Use pestpaid eard. Circle No. 176



lenth Write for and prices.

Inc. Brooklyn, N.Y. Burr & Son, Use postpaid card, Circle No. 461



A comparator known as the Big Twin Eighteen Model offers both a large 18" diameter image screen, as well as duplex operational features. The optical system gives bright images on the screen with unusual crispness at all magnifications. Lenses to provide magnifications of 10X, 20X, 25X, 311/4X, 50X,



Use postpaid card. Circle No. 462



Protects ways and screws on boring mills, Kellers, grinders, etc. Keeps chips and abracive dirt out of ways, and moving parts—Prolongs life of machine, saves costly repairs and over-haul time. Roller costructed of seamless steel tube with special long life springs. Curtain is of neoprena fiberglass material imperious to oil and cut-ting compounds.

3 standard sizes Special sizes to order

TOOL SUPPLY CQ. 40 CUSTER ST. DETROIT 2, MICH.



62½X, and 100X are available as standard equipment.

Accessories include a co-ordinate measuring stage, a right angle platform

Sent upon request TORQUE JURILLA Sent upon request Formulas Applications Engineering data Screw torque data Adapter problems General principle

PA STURTEVANT CO. ADDISON QUALITY ILLINOIS

Use postpaid card. Circle No. 464 May, 1958 type stage as well as a graduated rotary screen with vernier scale.

Portman Instrument Co., Town Dock Rd., New Rochelle, N.Y.

Use postpaid card, Circle No. 177

General Purpose Lathes

These 12-inch general purpose lathes have big capacity—121/4" swing over bed, 12" swing over saddle wings, 8" over cross slide, up to 36" between



All Makes All Models Repaired Properly

Since 1930 Scanners, boresights binoculars made and manufactured.

Md. Precision Instrument & Optical Company 12 E. Lanvale St. Baltimore 2, Maryland

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TROYKE

WORM WHEEL OPERATED
ROTARY TABLES

PRECISION GROUND TABLES AT



A size and type to meet your requirement.

For complete information and prices write for Free Catalog No. 22.



TROYKE MFG. CO.

11290 Orchard Street Cincinnati 41 (Sharonville), Ohio

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297



MUMMERT-DIXON FACING HEADS

with Automatic Feed

One-way Tool Feed-8, 9 and 12" sizes.

Two-way Tool Feed—9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes. Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO. 122 Philadelphia St., Hanover, Pa.

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Atlas 12" lathes-pedestal base and bench types.

centers. They are ruggedly and accurately built for close tolerance work; have new massive headstock and tailstock and new heavy-duty bed and carriage for rigidity and stamina, Spindle turns on Timken tapered roller bearings. Tops, sides and bottoms of bed ways are precision ground to close tolerance and headstock, carriage and tailstock are hand fitted to bed.

These features are standard equipment: 16 spindle-speeds, complete Vbelt drive, power cross and longitudinal feeds, wide feed and thread cutting range. Lathes are available in pedestal base models with underneath drive with two V-belts turning the spindle and in bench models with horizontal bench-mounted countershaft.

Specifications: 121/4" swing; 24" and 36" between centers; thread rangequick-change gear lathes, 54 selections, 4 to 240-standard change gear lathes. 98 selections, 4 to 96; 16 spindle speeds, 8 direct, 8 back geared; speed range. 28 to 2072 rpm. Bench lathe prices start at \$325 f.o.b. factory.

Atlas Press Co., 22107 N. Pitcher St., Kalamazoo, Mich.

Use postpaid eard Circle No. 178

ROVED MACHINE TOOL



QUICK ACTION VISE (Size No. 7)
For drill press or milling machine, Designed for production work,
occentric motion to apply pressure to Jaws. Eccentric parts harde
insure long life. 6" Jaws. 1%" deep, opens 4". Price \$111.00

SHAPER VISE with Graduated Square Swivel Base (Size Ne's 4 & 48) Base is graduated and has tongue in center to fit slot in table. Also heles for belting down.

Size No. 4—0" jaws, 1½" deep, opens 5". Price \$103,50
Size No. 40—10" jaws 2¼" deep, opens 8½". Price \$148,50

Dealers' Inquiries Invited-All Prices Net F.O.B. Chicago Write for descriptive literature

3230 ARCHER AVE J. E. PLUNKET MACHINE CO.

Use postpaid card, Circle No. 468

MACHINE and TOOL BLUE BOOK

Lathe and Grinder Centers

Tool Service Oil Jet lathe and grinding machine centers are now also made with inserted carbide tips. Their basic design is identical to that of the manufacturer's super-hss Oil Jet centers, where a high-temperature, extreme-pressure lubricant is stored in a sealed grease cup and channeled to the friction area through a minute axial passage. A small oil-groove with rounded edges



provides constant and equal distribution of the lubricant over the whole contact area.

The carbide inserts used are one or two sizes larger than accepted industry



Short-Run Design Suggestion Sample

ENGINEERS responsible for the design function will welcome this practical short-run stamping sample which visibly shows various common conditions that occur in metal fabrication.

An actual production sample, it indicates typical mechanical problems met with in terms of type of material, temper and thickness.

REQUEST SAMPLE AND BULLETIN DDS-2 ON YOUR LETTERHEAD

DAYTON ROGERS

Manufacturing Company

MINNEAPOLIS 7C, MINNESOTA
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standards. Centers are made with full and gash point, in every size and taper combination, with male and female points and straight shanks.

Tool Service Co., Hookers Point, P.O.

Box 10265, Tampa 9, Fla.

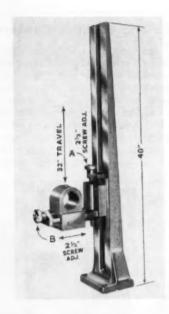
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Adjusting Compound Holds, Locates Spindles, Work

An adjusting compound offering precision holding and locating provisions for spindles and workpieces is available. Constructed of cast aluminum with anodized finish, it is light and easy to handle. Compound has wide range of adjustments. Horizontal and vertical dials, screws and nuts are steel and machine calibrated in thousandths, and are said to offer complete accuracy.

Tracer Control Co., 595 E. Ten Mile Rd., Hazel Park, Mich.

Use postpaid card, Circle No. 180







Div. British Industries Corp. Port Washington, New York



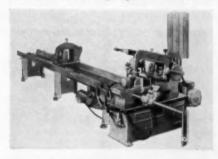
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MACHINE and TOOL BLUE BOOK

Metal Cutting Machine Has Stepped Up Cycling Time

Models 66W2A and 66W4A of the automatic stock feed metal cutting machine, offered in two or four speed models, has stepped up cycling time, giving 1" pushup per second. Accuracies to .005" is assured by a microswitch control.

The machine will cut cold rolled steels, cast iron, high speed steels, hard





Use postpaid card. Circle No. 472





MACHINABLE CARBIDE is available!

Ferro-Tic is a new material, combining the advantages of conventional tungsten carbides with the flexibility of fabrication of tool steels, which can be annealed, machined and quench hardened by using generally available equipment.

Ferro-Tic provides for GREATER ECONOMY for tool and die users as slow, costly diamond grinding is eliminated.

Ferro-Tic AVOIDS DELAY since requirements for special carbide parts can be satisfied by machining stocked standard blanks when and where needed.

Ferro-Tic is EASY TO FABRICATE with standard machine tools . . . making the production of complex shapes practical as well as economical.

Send for complete information Ferro-Tic

Available through the developer and producer



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CORP. OF AMERICA 134 WOODWORTH AVE. YONKERS 2, N.Y. Yonkers 9-6767



For This Production Boosting
"TRICO-MIST"
COOLANT SYSTEM

With Flexible Armored Coolant Lines And Kwik-Change Nozzle,



For drilling, tapping, milling, sawing, grinding, etc. Removes heat from cutting edges of tools and work. Feeds can be increased considerably, finer finishes and accuracy are obtained. TRICO-MIST absorbs heat, thereby quenching it faster than flood coolants which only transfer it. Chips slide freely up the tool face and are blown away automatically. Simple needle valve controls size and volume of mist spray. Attaches to shop air line. Available with one and five gallon containers — single or multiple outlets — single or dual valve control.

SEND FOR BUL. 37

TRICO FUSE MFG. CO.

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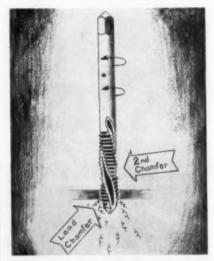
alloys as well as titanium alloys. A fast-operating automatic air vise plays an important part also.

Racine Hydraulics & Machinery, Inc., 2000 Albert St., Racine, Wis.

Use postnaid card, Circle No. 181

Tap Features Continuous Spiral Point

The Regal Jet Tap offers a continuous spiral point tap with single or multiple chamfer sections. Advantages



center around this point. The tap forces the lubricant to the cutting edge thereby extending the life of the tap. It also pushes the chips ahead of the tap, eliminating the problem of chips clogging the flutes.

The tap is available in machine screw sizes 6, 8, and 10 for shallow hole depth threading.

Lower initial cost coupled with savings on resharpening and replacement provide a 75% savings in costs to users, according to the manufacturer.

Beloit Tool Corp., Beloit, Wis.
Use postpaid card. Circle No. 182

MACHINE and TOOL BLUE BOOK



Multiform BENDER CUTTER

CUTS. BENDS, PUNCHES

Available in hand, air and hydraulic models, the MULTIFORM is shipped complete with full assortment of dies and mandrels to punch, bend, and cut round or flat brass, bronze, aluminum, rteel, etc., up to ½"x1½" as illustrated, other models up to ½"x8".

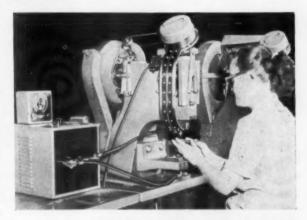
J. A. RICHARDS CO. KALAMAZOO, MICH.

Use postpaid card. Circle No. 474

Automated Eyeleting Machine Speeds Printed Circuit Production

The special Segal automatic eyelet attaching machine is said to make it possible for a manufacturer of printed circuits to speed production and virtually eliminate the possibility of eyelet failure. The unit incorporates a number of electrical and mechanical features devised by Bell Telephone Laboratories engineers at Whippany, N.J., to facilitate experimental investigations of printed-circuit wiring.

Since circuit board failures could result in losses of hundreds of dollars in equipment, boards eyeleted by this new



method are subjected to rigorous tests to assure reliability. After thermal shock, physical shock, high frequency







THE BOOSTER-BAR

A new accessory — gives 65% increase in the capacity of your present Center-Mike white for bulletin #955

SORENSEN CENTER-MIKES, Inc. 264 KOSSUTH ST., BRIDGEPORT 8, CONN.

Use postpaid card. Circle No. 476

vibration, and humidity soak tests, not a single eyelet failure has been discovered on boards of any of the materials, according to the announcement.

Edward Segal, Inc., 72 Spring St., New York 12, N.Y.

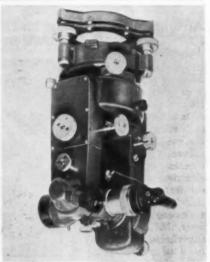
Use postpaid card. Circle No. 183

Optical Instrument for Checking Fixtures, Gears

The redesigned Microptic Theodolite No. 2, Mark II, has the circle reading eyepiece placed outside the upright. It can be revolved separately on its own bearings so that when viewing steep angles, reading can be made in comfort. The high-precision bubble controlling set-up is now totally enclosed.

A short auto-collimating eyepiece provides readings to 1 second on horizontal and vertical rotation independent of centering.

The instrument is used in the alignment and setting up of large structures, and will find application in high pre-



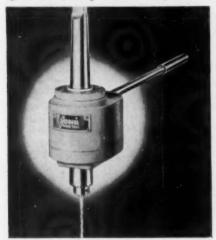
cision gear testing, and in special fixtures and machines.

Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.



Attachment Turns Drill Press to High Speed Drilling Machine

The Drillspeeder has a maximum speed of 30,000 rpm and is adaptable to



any conventional style of drill press spindle, converting it into a high speed drilling machine. The unit permits the use of solid carbide drills and reamers, and is ideal for high speed drilling of small holes. It features spindles of heat treated steel, ground after hardening to insure minimum "run out".

Its specifications are: gear ratio, 4 to 1; chuck cap. No. 80 to 5/32".

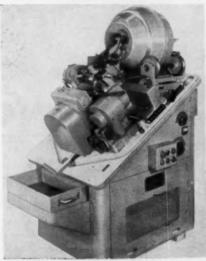
Jarvis Corp., Middletown, Conn.

Use pestpaid eard. Circle No. 185

Slotter With 15-Min. Change of Screw Size

A complete changeover from one screw size to another can be made in approximately 15 minutes on screw slotting machine available. It will handle screw blanks from No. 2 to 5/16" nominal up to 2½" long. The machine has a variable speed rotary hopper designed for efficient and trouble-free feeding. It also has a rotating mechanism which employs replaceable highspeed steel inserts.

for MAGNETS phone: MAIN 2-0114 teletype: NY 2-4957 for the permanent magnets you need-all sizes, all shapes, all grades. Experimental or production quantities. · Engineering · Precision Cutting Precision Grindina · Magnetizing Catalog upon request. 24 HOUR DELIVERY PERMAG CORP.



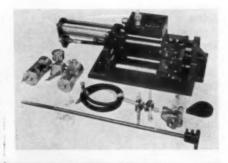
Use postpaid card. Circle No. 478

210 TAAFFE PL., BROOKLYN, N. Y.

Roy Machinery & Sales, Inc., New Britain Ave., Farmington, Conn. Use pestpaid card. Circle No. 186

Improved Air Feed May Be Used as Feed to Power Shears

The open throat air feeds, for automatic operation of mechanical and hydraulic stamping presses, may be mounted on front or back of presses and can be timed by the press ram or crankshaft. The improved air feed may now be used as a feed to power shears, power brakes, four slide machines, and welders.









784 PLEASANT STREET, WATERTOWN 72, MASSACHUSETTS

The units may be made in 6", 12", 18", and 24" feed length sizes, in either right or left hand models. They operate on air pressures of 60 to 100 psi.

Cooper Weymouth, Inc., Stratford,

Use postpaid card, Circle No. 187

Attachment Simplifies Boring and Taper Turning

Master taper attachment equips any type of lathe to perform taper turning.



boring, and threading—internal or external—as simply as straight line tool

MEMBER ASMMA



Blue Devil SOCKET SCREW PRODUCTS

"SOLD ONLY THROUGH AUTHORIZED INDUSTRIAL DISTRIBUTORS" means that close by are complete Blue Devil stocks for immediate delivery plus experienced personnel to advise you.

WRITE TODAY for complete information and name of your nearest Blue Devil distributor.

SAFETY SOCKET SCREW COMPANY

6512 North Avondale Avenue * Chicago 31, Illinois
Warehouses at: Chicago, Los Angeles, San Francisco, Detroit, New Haven, New York City
Use postpoid card. Circle No. 481

operation. It is universally adaptable. Original installation requires drilling only two holes on the carriage for fastening the overarm.

Tapers up to 4" per foot, or 20 degree in either direction are possible with the taper for a maximum of 12" longitudinally. Swivel bar with V-ways is graduated in degrees at one end, inches at the other.

The attachments range in price from

\$45.00 to \$49.50, depending on lathe type and work capacity. A heavy duty type is available for larger lathes, priced from \$125.00 to \$149.50, depending on lathe model.

General Sales & Engineering Co., 4525 N. Clark St., Chicago 26, Ill.

Use postnaid eard, Circle No. 188.

Angle Iron Shear With No Distortion to Bar Ends

The angle iron shear, operated by foot treadle and by means of a two way selector valve, may be used with the manufacturer's No. 95 hydraulic press. The complete cycle time is 6 seconds, with a 3 hp motor. Side thrust blocks prevent misalignment of the blade and die, or wear to the cylinder wall.

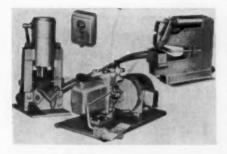
According to the announcement, there is no distortion to the ends of the bar. Shear and parts can both be operated



A clean white powder. Improves cutting oils. Dies last longer. Solves tough lubrication problems. Ask for free samples.

SCIENTIFIC LUBRICANTS CO. 3469 N. Clark St. Chicago 13, III.





from the same power supply.

Additional blades are obtainable to shear 5/16" x 6" flat stock, or bending dies to form right angle bends in round and square, or up to 3/4" x 6" flat stock. Dies and inserts are also available to shear various sizes of channel iron.

W. A. Whitney Mfg. Co., 636 Race St., Rockford, Ill.

Use postpaid card. Circle No. 189



PALMGREN

Vises, Rotary Tables, Milling Attachments can speed up production, solve difficult angle jobs.

Used In All Industries... Everywhere



SWIVEL MACHINE VISE \$9905



No. 246 ANGLE PLATE \$1595



No. 14 DRILL PRESS VISE \$1995

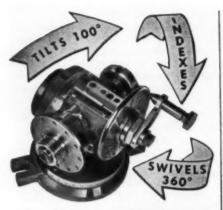
Get this FREE Catalog NOW on work holding tools, showing 68 models and types of Palmgren vises, rotary tables, milling attach-

tables, milling attachments and other machine tool accessories, with jaw sizes from 1½" to 8" showing details and prices.



TILTING, INDEXING and ROTARY TABLE \$13950

CHICAGO TOOL & ENGINEERING CO.



FOR FASTER PRODUCTION

THE ELLIS

DIVIDING HEAD

Although it is built to fine instrument standards, the ELLIS is a really rugged tool room or production tool that's designed to unusual versatility. Its universal motions—swiveling in two planes—will save time and increase profits and accuracy on your millers, grinders, drill presses and jig borers. It has 6½" swing, or 11" swing when used with riser blocks. Work may be held between centers, or in chucks or collets. To save rehandling of work, and to save money, investigate the ELLIS by writing for complete details!



76-G MAMARONECK AVE. WHITE PLAINS, N. Y.

Use postpoid card. Circle No. 485



Nickel-Plated Brass Filter for Compressed Air

A single-tube Fulflo filter for compressed air has 7" honeycomb filter tubes which are said to provide true depth (not surface) filtration to minimize gumming and remove moisture, oil, microscopic rust, and dirt particles. Tubes are available in a wide range of controlled densities.

Flow rates are 50 cfm (free air) at 40 psi; 70 cfm at 80 psi; 76 cfm at 100 psi.

Commercial Filters Corp., 2 Main St., Melrose, Mass.

Use postpaid card, Circle No. 190

Saw Notches 600 28-Bar Commutators Per Hour

The automatic lead wire saw is an addition to the manufacturer's line of automated electric motor production equipment.

The saw is said to be capable of notching 600 28-bar commutators per hour by simultaneously cutting two lead wire slots each machine index, and will run until the loading magazine is empty, then shut itself off. It will notch commutators up to 1½" diameter and 1½" length, and can be



adjusted to a new size in about twenty minutes.

Motor-Mation, Inc., P.O. Box 2145, North Canton, Ohio.

Use postpaid card, Circle No. 191





Eliminate excessive overhang of your center. Use the accurate, rugged, reliable 'NIROL. The spring loaded Live Center that compensates for expansion and contraction in actual operation.

> Write for complete information.

*Reg. U.S. Pat. Off

MANUFACTURING COMPANY 900 H'WAY 22, N. PLAINFIELD, N. J.

Use postpaid cord. Circle No. 486

May, 1958



Fastest Profile Milling and Duplicating

Save up to 50% and more machining time on contoured parts with both the R-200 and R-300 models. Single-lever control allows operators to duplicate complex parts in a fraction of the usual time.

R-200 - 2-Dimensional Profiler for any vertical miller

R-300 -2- and 3- Dimensional for **Bridgeport millers**

Capacity: 6" x 6" (7" x 6" Special) 1 to 1 ratio with master

For literature write to

J. M. KALINS & COMPANY

1575 Railroad Ave., Bridgeport, Conn.

Surface Grinder Unit for Greater Accuracy

When used with a surface grinder, a motorized center unit is said to make possible concentricity and squareness accuracies of 50-millionths inch. The device is being offered for application in tool rooms and specialty shops. Jobs not normally handled on a surface grinder can be set up easily and ground accurately with the unit.

New Precision Hardened & Ground



Ready to use, easily mounted, vertically actuated, complete side piercing units for round, square or oblons holes on sides of sheet metal parts.



Capacities up to ½ inch holes. Prices start as low as \$125.00 per unit. These punching units will pierce holes in sheet metal up to 16 gage (.062) in thickness.

Pholps Street Maribore, Mass.
Use postpaid card, Circle No. 488

3 A

The live center is mounted in a precision ball bearing and is driven by a ¼ hp motor through a speed reducer. Center speed is 78 rpm.

AA Gage Co., 350 Fair St., Detroit 20, Mich.

Use postpaid card. Circle No. 192



THIS HAND IS IN THE CHIPS! Yes, and the chips are not in your eyes or hair or ways of machines. The Heimann Magnetic Chip Remover gets chips out of blind holes rapidly, cleanly, safely. It's a lastingly efficient, permonent magnet in a knurled aluminum holder. Send it in after chips and it comes out covered with them.

YOU CAN'T AFFORD to be without it! A natural for your tool box or crib. Made 1/6" to 1/2" sizes, at a price to attract. Write new for circular.

HEIMANN MFG. CO.,

Use postpaid card. Circle No. 489



Use postpaid card. Circle No. 490

MACHINE and TOOL BLUE BOOK

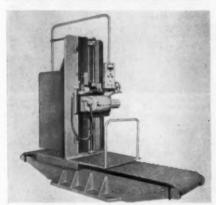


Abrasive Wheel. Composed of thousands of finger-like abrasive strips, which produce a highly resilient brushing action, this abrasive wheel is said to exert more exact control in working complex contours without flagging or diggings. Sizes include diameters of 14" and 16", with widths from 3" to 60". Merit Products Inc., 3691 Lenawee Ave., Los Angeles 16, Calif.

Use postpaid eard. Circle No. 193

Futurmill Sells Rights on Milling Machine

Futurmill, Inc. has announced that the manufacturing rights for the Futurmill structural milling machine have been sold to Baldwin-Lima-Hamilton Corp. Exclusive sales distribution of the ma-



chine will be retained by Futurmill in conjunction with their line of indexable blade milling cutters, power spindles, and Loadmeters, which originally led to the development of the machine.

Futurmill's carbide milling engineers set-up and install, completely integrated, one-package milling operations, or they convert existing planers, boring mills, milling machines, and other machine tools to high-speed carbide milling operations.

Futurmill, Inc., 6360 Highland Rd., Pontiac, Mich.

Use postpaid card. Circle No. 194

Tooling Bridge Equipment Measures Irregular Objects

A new line of lightweight tooling Bridge equipment provides the engineer with a new tool for the accurate three dimensional measurement of irregularly shaped objects, such as



Challenge lightweight tooling bridge equipment.

models, prototypes, tools, dies or finished stampings or castings.

A typical setup consists of a semisteel base unit and lightweight magnesium vertical and horizontal units, such as shown in the photo. These vertical and horizontal units can be easily moved in any position desired. Base plates, uprights, platform angles, parallels and sliding angles of various types are available.

Challenge Machinery Co., Grand Haven, Mich.

Vertical Milling Machine

The Mattsson & Zetterlund vertical milling machine, type VF-600, made in Sweden, has been designed for the



manufacturer of jigs, fixtures, and gages, and to produce accurate components for instruments.

The spindle is of nitrided steel and has a standard No. 30 milling machine taper. Either manual or automatic feed is provided for the longitudinal and vertical movements. A hinged stop permits use of several sets of blocks simultaneously.

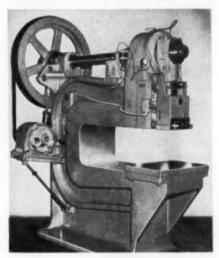
Homestrand, Inc., Larchmont, N.Y.
Use postpaid eard. Circle No. 196



Use postpaid card. Circle No. 492

Deep Throat Press

The Model 15M 45-ton heavy-duty press has a 36" depth of throat, a 4" diameter shaft at pin bearing, 24 x 16



bed area, 14" open height and alloy cast frame. It carries a 750 lb. 38" end flywheel.

Available in plain and geared models, and with pin or air clutch.

Perkins Machine Co., Warren, Mass.
Use postpaid card. Circle No. 197



Drill Test Microscope, for checking twist drills from 1/16" to 7/16" diameter, is equipped with two optics. The larger lens of the German Titex instrument checks the concentricity of the chisel edge, while the smaller one checks the point angle and a normal relief angle of 6°. W. Von Arnauld Co., 95 Grove St., Oakland, N.J.

Use postpaid card. Circle No. 198





Nail-On Swivel Glides are made of tough, durable Marlex or nylon plastic that will not rust or crack and are said to afford excellent sliding characteristics. Pictured are blonde, black, and natural white color Nail-On Imperials, and walnut wood tone Nail-On Imperial swivel glide used on wood leg with metal ferrule. Plastiglide Mfg. Corp., 1757 Stanford St., Santa Monica, Calif.

Use postpaid eard. Circle No. 199

Double Stroke Air-Index Adaptor converts any long-life Ross Skyline series valve to momentary action. How it works: used in single solenoid valve, valve reverses and stays put as solenoid is energized. Used with air-operated valve, valve reverses and stays put with each pilot air impulse. (See arrow) Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3.





High Speed Heavy Duty Power Drills have a heavy web construction, able to stand stress and strain. Drills, in sizes No. 40 to 1/2", conform to NAS-907 Type C specs., and feature a 135° split point for fast penetration. For drilling sheet metal, hard steels, stainless steels, etc. Sizes are 3/64" to ½", A to Z, and No. 1 through No. 60. Whitman & Barnes, 40600 Plymouth Rd., Plymouth, Mich.

Use postpaid card. Circle No. 602



Torque Wrench. Extreme difficulty in holding the .025 plus or minus .001 deep counterbore, on a light drill press, was the problem solved by the use of the sensory signaling Model S200-I torque wrench, replacing the regular drill press handle. This enabled the operator to control to exact limits the force applied on the spindle of the press. P. A. Sturtevant Co., Addison, Ill.

Use postpaid card. Circle No. 603

A Hole Relation Gage, called Con-Chek, permits operator to check hole location and concentricity, without turning either hand, or the gage handle, and yet read the indicator directly. The instrument is simply inserted into the master fixture, with indicator face-up. Smallest model has cap. of .200" dia. min.; largest is 1.750" dia. Mayes Tool Co., 26514 W. 7 Mile Rd., Detroit 19.

Use postpaid card. Circle No. 604



HOLDS SECURELY IN ANY POSITION



The 'original' dial indicator holder with push button control holds securely in any position, the original Dial Indicator Holder with pushbutton control, designed to provide the most secure and accurate hold for all dial indicators.



BASE

For descriptive literature and address of sales agent in your area write to-

JAMES NEILL & CO. (U.S.A.) LTD.

37-39 PEARL ST . NEW YORK 4

MADE IN SHEFFIELD . ENGLAND BY JAMES NEILL & CO. (SHEFFIELD) LIMITED



Reinforced E-Ring, Waldes Truarc series 5144, is designed for assemblies in which ring is subject to strong forces from heavy vibration and shock loads. The fastener is said to have five times gripping power of regular E-type rings, and 50% higher rpm limits. The ring is used to secure a small wheel on shaft in illustration. Waldes Kohinoor, Inc., 47-16 Austel Pl., Long Island City 1.

Use postpaid card. Circle No. 605

Hand-Operated Screw Driver, Safe-Torque, is built to industrial standards with a roller drive clutch for use in range of 0 to 25" lb. It is ideal for precision assembly production and maintenance jobs where air- or electric-powered tools are not available. Because torque setting, not operator, determines degree of tightness, there is no need of guesswork. Scully-Jones and Co., 1901 S. Rockwell St., Chicago 8, Ill.



Use postpaid eard. Circle No. 606



Transfer Gage inspects accuracy of perpendicular surfaces easily and with precision. It provides assured measurements when used with reliable surface plate. The instrument features hardened steel base, relieved to permit positive contact with surface plate to prevent air film error. Height of the $2\frac{1}{4}$ " dia. .0001" dial indicator is adjustable from 3" to 12" on graduated column. The DoAll Co., Des Plaines, Ill.



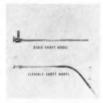


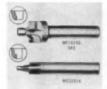
Inspection Fixture. The following method can be used in checking the relative location of holes. Needed is a couple of parallels made of cold rolled steel, and a couple of drill rods, any given size and diameter, drilled and reamed in position. Merely engage the two drill rods in position, and with a pair of micrometer calipers, the dimension can be checked. Idea from Dayton Rogers Mfg. Co., Minneapolis 7, Minn.

Use postpaid card. Circle No. 608

A High-Precision Optical Inspection Instrument, called a Bore-O-Scope, has made easy inspection of internal portions of aircraft engines, aircraft propellers, etc. It is available in various diameters, lengths, and angles of vision, and comes in sizes from 3/16" O.D. and up, from 8" to longer than 15'. Size Control Co., 2500 W. Washington Blvd., Chicago 12, Ill.

Use postpaid card, Circle No. 609





Carbide-Tipped Port Contour Cutters for profiling the MS-33514 flareless tube connector contour and the MS16142 internal 0-ring boss for straight thread tube fittings are now available. Cutters come in 13 diameters for all sizes of fittings used with \%" through 2" diameter tubing. Sonnet Tool and Mfg. Co., 578 N. Prairie Ave., Hawthorne, Calif.

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FINENTAL Certified DRILLS

SHARP

Today's drilling problems on both standard and new metals require twist drills with something extra built into them. That's why Continental drills are so acceptable to leading cost conscious production plants. Ask your industrial jobber

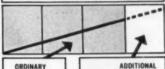
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MORE HOLES PER DRILL

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COUNT MOREHOLES
SHOW YOU HOW
TO CUT COSTS



Use postpaid card. Circle No. 496

MACHINE and TOOL BLUE BOOK



Portable Hand Grinder, Model No. 2 Moto-Tool, 6" long, weighing 13 oz., is handy for fast precision grinding, drilling, polishing, etc. The short body and ease of handling permits working in close quarters. It produces 27,000 rpm, yet handles easily as a pencil, giving operator feather touch control on close tolerance work. Dremel Mfg. Co., 2100 18th St., Racine, Wis.

Use postpaid card. Circle No. 611

Welding and Cutting Outfit does multiple jobs as welding, cutting, heating, brazing, etc. Welding range with 3 tips supplied is 1/32" to 3%", but 9 other tips increase cap. to 7%". Cutting range is from 1%" to 4" (with correct accessory tips), as well as sheet metal cutting. Slip-in tips can be seated with simple finger pressure. Smith Welding Equipment Corp., 2633 S.E. 4th St., Minneapolis.

Use postpaid card. Circle No. 612



ALLES AND ALLES

A One-Piece, Multi-Purpose Parts Bin of 20-gauge drawn steel fits a wide range of standard and custom racks for use on assembly benches. A newly-designed label holder makes parts identification easy. Available in 6"Lx4"Wx3"H units, either single or partitioned, and in a size 6"Lx8"Wx3"H. Service Parts Systems, Inc., 13380 E. Nine Mile Rd., P.O. Box 243, E. Detroit, Mich.

Use postpaid card, Circle No. 613

SLOCOMB SNAP GAGE MICROMETER Replaces Full Range of Fixed Snap Gages

Simply set the two micrometer spindles to the Go—No Go sizes...lock them in position and you have an easy-to-use snap gage for any operation. One Slocomb snap gage micrometer actually replaces full range of fixed snap gages. Helps you conserve production and inspection time... cuts tool room inventories. Available in full range of sizes.





Write for your illustrated brochure.

J. T. SLOCOMB COMPANY, Glastonbury, Connecticut

THE BEST

ELEVATING TABLE

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(Eliminates Cranking)



2000 LBS. OR *1000 LBS. CAPACITIES *ILLUSTRATED

A precision made MIDWEST TABLE Costs no more!

- It's hydraulic . . . positions work or feeds at desired height without use of hands
- Rigid cast construction
- ► Top turns 360° and clamps
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Write today . . . specials on request

MIDWEST

112 WEBSTER ST., DAYTON 2, OHIO

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Quick Clamping Tool Holder

The Multifix quick clamping tool holder, made in Switzerland, is said to set up tools in one-tenth the time re-



quired for square turret holders. It allows the setting of a cutting tool at any desired clearance angle,

Tools may be clamped in 40 different positions and successive operations are unlimited in number.

The tool holders are available in 3 sizes, with accessories, manufactured from case hardened chrome steel.

G. and D. Sales Co., Dillerville Rd., Lancaster, Pa.

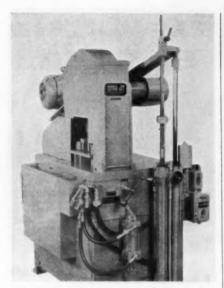
Use postpaid card. Circle No. 614

Oscillating Dry-Abrasive Cutter

Almost any metal or other hard material can be cut economically with the heavy-duty and high-speed Campbell Model 28 Sever-All, according to the announcement.

Designed for use in metalworking plants, factories, and maintenance shops, the unit is said to provide, with a minimum burr, high quality cutting of large shapes. It is basically an oscillating type unit in which the abrasive cutting wheel and workpieces are manually fed by the operator.

As an optional feature, the unit can be equipped with power wheel feed,



power oscillation, and air-operated work clamps.

Allison-Campbell Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.

Use postpaid card. Circle No. 615

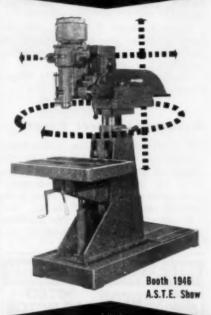
Template Machine Drills Holes to +.002"

A compact coordinator machine rapidly locates and drills holes in templates to within +.002". It is also applicable for producing drill jigs, simple fixtures, and other precision work in



May, 1958

NEW DRILLING CONCEPT CUTS COSTS



with the new

JOHANSSON RADIAL DRILLING MACHINE

you can

- Bring tool to each hole location fast and accurately, by finger touch
- Select spindle speed instantly, without stopping motor
- Change tools in seconds with built-in automatic drill ejector
- Convert from drilling to a tapping machine in time it takes to turn a switch
- Drill, ream and tap holes on any compound angle just by tilting drill head
 Gear drive to all spinalle speeds, 60—3000
 RPM. Drills up to 2' dia. Swings workpiece over 4 ft. high and over 4 ft. in diameter

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1. O. JOHANSSON COMPANY 7249 ST. LOUIS AVE., SKOKIE, ILLINOIS

flat sheet metal. It is particularly suited for producing templates up to 36" x 42" for Wiedemann turret punch presses and other equipment. Holes from 1/16" to 3/8" dia. are accurately located and drilled.

Using a simple X and Y chart for hole locations, the operator sets the dimensions quickly with two optical

Wiedemann Machine Co., 716 Wissahickon Ave., Philadelphia 32, Pa. Use postpaid card. Circle No. 616

Automatic Power Press

A small automatic press is now being introduced by manufacturer to the American and Canadian industry. The Abro 21/2 ton baby motorized power press, with automatic roller feed, is infinitely variable from 0" to 3".

The press is suitable for blanking. piercing, clipping, and embossing, with

NEW SCHERR PROJECTOR

MICRO



continuous runs in strip or coil of light gauge metals, plastic, film, cardboard. paper, and wire.

Wharton Unitools, P.O. Box 202, Valley Stream, L.I., N.Y.

Use postpaid eard, Circle No. 617

Knurled Setscrews for Hopper Feeding

Serrated, or knurled, cup point setscrews are now being offered in a



special type for use in the Setkooriginated hopper feeding system. The knurled cup point is claimed to have special holding powers. The screws are available in a choice of hexagon and fluted socket types.

Set Screw & Mfg. Co., Bartlett, Ill. Use postpaid card, Circle No. 618





Open Gap Horn Press

One of three like presses purchased by a large manufacturer of automotive tires for coining tire rims is the 500ton open gap horn press. It has an 8" throat depth, 6" stroke.

The frame is of welded steel construction. The press is equipped with H-P-M's closed circuit Fastraverse system of operation with manual and automatic press control.

The Hydraulic Press Mfg. Co., A Div. of Koehring Co., Mount Gilead, Ohio.

Use pestuald eard, Circle No. 619

Kit Makes Working Models of Machines

A construction kit has been designed to enable engineers, machine designers, scientists, inventors, and automation specialists to make precision working models of practically any type of machine, drive, or mechanism, according to the manufacturer.

The construction system uses a basic concept of round rods and beams that are assembled into frameworks by

CORRECT CLEARANCE

Longer Punch & Die Life

One naturally follows the other.



Because of this, new die sizes are continually being added to our large, planned stocks so that dies with correct clearance for **beth type** and **thickness** of metal to be punched are immediately available in styles to fit most makes of punch presses.

Our **new** decimal die marking system makes the selection of die with proper clearance easy.

Just try them and see the difference correct clearance makes in work quality and in tool life.

Catalog sheets listing our complete stock of punches and dies with charts and instructions for figuring clearance are available on request. Our hand operated punches, cutters, and benders are, also, illustrated and described; and punch chucks, die beds, coupling nuts and other metalworking accessories are listed.

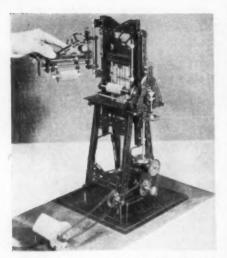
More than 70 years of experience goes into every Lewthwaite tool . . and it shows!



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New York 17, N.Y.



rugged clamping means. It is said to be possible to construct smooth-operating, precision-detailed mechanisms such as reciprocating motions, slide motions, geared transmissions, differentials, and coil-spring devices with standard kit components.

FAC Division, 9551 Grand River Ave., Detroit 4, Mich.

Use postpaid card. Circle No. 622



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Medium Duty . Precision Made In England



MODEL 580 Self-centering Geared Scroll UNIVERSAL Three Jaws

Includes | Set External Jaws, I Key, Set Internal Jaws, 3 Pinions, 3 Belts

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|---------------|--------------|
| WEIGHT (lbs.) | CHUCK |
| 31/2 | 26" |

| (lbs.) | BORE | |
|-----------------|---------|----------------|
| 31/2 | 56" | \$ 35.78 |
| 12 | 144** | 35.75 41.58 |
| 171/2 | 1-9/10" | 48.00 |
| 42 | 265.W | 71.50 |
| 62 88 143 | 3" | 88.50 |
| 88 | 31/.0 | 120.00 |
| 200 | 4" | 261.00 |
| 262 324 | 472. | 320.00 |
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PRICE



MODEL 550 4-JAW INDE-PENDENT CHUCK

Includes 4 operating serows, 4 Reversible Jaws, 4 Bolts, 1 Key

Order Today

Dept. A. 251 Centre St. New York 13, N.Y. CAnal 6-5575

| SIZE | WEIGHT (ibs.) | CHUCK | PRICE |
|---------------------------------|--|--|---|
| 41/5" 6" 8" 10" 12" | 8 16 34 60 80 98 126 | 1-9/10° 1-9/10° 13/4° 2° 25/4° 3° | \$ 30.50 35.00 51.00 62.50 74.50 84.00 |
| 20" 22" 24" 30" | 204 246 322 490 | 4" 5" 8" 8V4" | 165.00 203.90 220.00 340.00 |

VICTOR MACHINERY EXCHANGE, INC. Dealers in Tool Room Equipment

Bullseye Puzzle Introduces Socket Cap Screws

A free sampler puzzle, called Bullseye, is available for design and production engineers, and all specifiers of screws, to introduce the line of coldforged socket-head cap screws. The screws are available in sizes No. 8 to 5%" dias., in alloy steel with isothermal heat treating.

One of the features of the cap screws is the "perfect-hole" socket (chip-free, accurately formed) said to give maximum strength and full gripping area on the hex keys.

Set Screw and Mfg. Co., Bartlett, Ill.





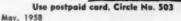
A Height Gage has been designed for use with the Check Master test indicator. Because the indicator responds to dimensional variations as low as .00002", the height gage adjustable to consistent tenth accuracy is for use with it. One finger pressure will raise or lower carriage to desired setting. Standard Gage Co., Inc., Poughkeepsie, N.Y.

Use pestpaid card. Circle No. 621

plates. A preci-

tow COST.







Chosse your sine har or sine plate from the complete Bald Eagle line starting at \$21.73 Order from your dealer or direct

Bald Eagle Corp.

(Formerly Bald Eagle Tool Company)

10"

1810

5"

F.O.B. St. Paul

356 Cedar St. St. Paul 7, Minn. Use postpaid card. Circle No. 504

Machine Grinds Spurs and Helical Gears to 12" O.D.

License to manufacture and sell the No. 12 Fellows-Reishauer gear grinding machine in the United States and Canada has been granted to the manufacturer by the Reishauer Tool Works Ltd., Zurich, Switzerland.

The machine is capable of grinding spur and helical gears up to 12" O.D. and 63/4" face width. Two lead screws



are available, one covering from 6 to 48, and the other from 20 to 120 diametral pitch.

The machine generates a gear tooth shape by an emery wheel on which a helix has been developed. In operation, the involute is generated as the grinding wheel turns in harmony with the work while the work passes axially by the wheel. The machine setup is reported to be simple and fast.

The Fellows Gear Shaper Co., Springfield. Vt.

Use postpaid card. Circle No. 623

Milling Machine Has Automatic Indexing Addition

A Swiss-made milling machine permits workpieces of a wide variety to be milled, as it is equipped with an automatic indexing attachment and is universally adjustable. This Reishauer FA machine can mill teeth on end or circumferential surfaces, or straight or





helical flutes on cylindrical or tapered tools.

Typical workpieces include milling cutters of all kinds, cylindrical and tapered reamers, countersinks, ratchet wheels, and index plates. The machine is suited for milling workpieces that require dividing operations.

Cosa Corp., 405 Lexington Ave., New York 17, N.Y.

Use postpaid card. Circle No. 624

Lubricant Prices Cut

Lower production costs resulting from increased volume were credited by S. C. Johnson & Son, Inc., Racine, Wis., for making possible price reductions averaging between 25% and 30% on its cutting fluids and drawing lubricants. The lower list prices will be accompanied by a distributor and consumer promotion.

Affected will be six cutting fluids and two drawing lubricants. They include TL-131, No. 130 Wax Cool, No. 230 J-Cool, No. 121 Wax Cut, No. 122

Wax Cut, No. 123 Wax Cut, No. 150 Wax Draw, and No. 151 Wax Draw. Under the new price policy No. 130 Wax Cool, for example, now sells as low as \$1.80 per gallon f.o.b.; formerly it was \$2.65 per gallon.

Use postpaid eard. Circle No. 825

Super Cobalt High Speed Drills

These drills are designed for tough drilling applications where it is impossible to use regular high speed drills, due to red heat. They may be used in work hardened stainless steels, hardened laminated safe steels, silicon chrome,



Production CHUCK

Will pay for itself in 60 to 90 days

On turrets, engine lathes, cuttingoff machines, drill presses or any type of chucking machine, the Barker Two-Jaw or Three-Jaw hand operated chuck will increase production up to one third and actually pay for itself while doing it in from 60 to 90 days.

Hand lever eliminates pneumatic and hydraulic systems, yet closes and locks jaws with lathe running or stopped. Over 30 years of labor saving, production boosting operation.



Hand lever classs and locks while



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THOMAS HOIST CO. 24 S. HOYNE CHICAGO 12, ILL.

and certain chrome nickel alloy steels.

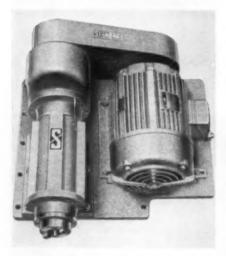
Available in taper shanks in fractional sizes.

Chicago-Latrobe, 411 W. Ontario St., Chicago 10, Ill.

Use postpaid card. Circle No. 626

Milling Spindles With Variable Speeds

The heavy-duty super precision milling spindle with through-hole for draw bar is equipped with a No. 50NMTB spindle nose. The integral geared transmission as pictured is assembled with a



2 to 1 or 1 to 2 timer-belt drive, with conventional precision power motor of selected horsepower. It features the use of an infinitely variable speed frequency changer to accomplish an infinite speed from 100 to 1000 rpm.

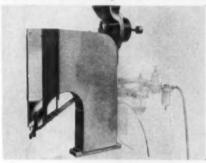
An assembly of this nature is said to convert the conventional planer into a milling operation, and may also be used with tracer control.

The Standard Electrical Tool Co., 2486 River Rd., Cincinnati 4, Ohio.

Use postpaid card, Circle No. 627

High Production Riveters for Automation Lines

Bench-type, pneumatic riveting machines, measuring $3\frac{1}{4}$ " wide, set tubular-steel rivets up to 5/32" dia, and



34" long on as small as 34" centers. They can be used in conjunction with in-line slide fixtures or rotary transfer tables for progressive, high-speed production assembly operations.

Actuated by a pneumatic cylinder that drives the setting tool through a toggle linkage, the machines will operate off shop air from 60 to 150 psi. When equipped with quick change raceways, they will set tubular steel rivets ranging from 0.058 up to 5/32" dia., and from 3/32 up to 3/4" in length.

Milford Rivet & Machine Co., Milford, Conn.



"Yes, we do have something in common. You're company president and I'm president of my local union."

Electronic Comparator Needs No Resetting

Because bearings or linkages are not used in the gaging head, it is reported that accuracy is assured once the S.I. electronic comparator is set, and no resetting is required regardless of the amount of usage. The needle repeats



its reading in 1/20th sec. when used on the same or dimensionally equal parts.

Accessories available with the comparator are a stand, a signal light indicator, and a multi-gaging head attachment.

Threadwell Tap & Die Co., 16 Arch St., Greenfield, Mass.

Use postpaid card, Circle No. 628

Foundry Cut-Off Wheel

The BZ2AA reinforced cut-off wheel, for off-hand floor stand and swing-frame applications, averages 33% longer life than the manufacturer's BZ2 cut-off wheel. This is said to result from an improved resin bond, having wearing qualities more closely matched to the wearing and fracturing behavior of the abrasive grain. In addition, it possesses chemical and heat-resistant properties.

Diameters are available from 12" to 20": thicknesses range, according to di-

a complete broaching service

plus ...



Conant offers complete engineering and manufacturing facilities for your broaching needs. Expertly designed for proper strength and chip carrying capacity. Prompt broach sharpening and reconditioning service. Order standard keyway broaches from our stock.

Your inquiry invited. Send us part prints for recommendation and quotation.

JONANT BROACH COMPANY



ameter, from 1/8" to 1/4".

Bay State Abrasive Products Co.,
Westboro, Mass.

Use postpaid card. Circle No. 629



No. 1A FRICTION
DRIVE TAPPER—copacity No. 2-56 to
36" in Steel—1/2" in
Aluminum.

B POSITIVE TAPPER—

No. 2B POSITIVE TAPPER — capacity 3/6" to 7/4" in Steel.
No. 3A POSITIVE TAPPER—capacity 1/2" to 11/4" in Steel—1/2" to 3/4" Pipe Taps.
Prised frem No. 4A TAPPER—capacity 3/4" \$62.00 to 2" in Steel including Pipe Write fer Taps.

Write for Bulletin PRODUCTION THREADERS
MMEDIATE with Round Split . . . Button
DELIVERY . . . Acorn Dies.

THRIFTMASTER PRODUCTS CORPORATION Division of Thomson Industries, Inc. 1030 N. PLUM STREET, LANCASTER, PA. ANDARD UNVERTAL ADDISTRAE AND STREET, PARE CONTR. DRICHHAI

Use postpaid card. Circle No. 509

Power Feed Attachment

A power feed attachment for the Crowningshield Model 328S 2 hp horizontal tool room miller has independent motor drive and reversing switch, 14" travel, and an infinite speed range from .600" per minute to 4.250" per minute. Speed settings are obtained by simply turning a large dial to the desired speed. Unit must be installed at the factory. Price \$395.

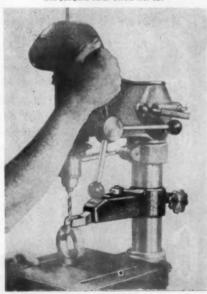
Crowningshield, Inc., Greenfield, Mass.
Use postpaid eard. Circle No. 630

Drill Press Work Holder

Sta-Put is said to be a convenient and efficient device offered to drill press operators. The split collar is easily attached to a drill press column and can be quickly adjusted. It is available with wheel or lever handle.

The holder claims to eliminate slipping, reduce drill breakage, and prevent injury to operator.

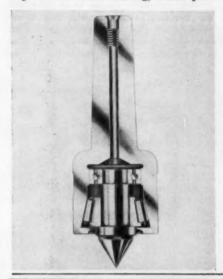
The Cincinnati Tool Co., 1945 Waverly Ave., Cincinnati 12, Ohio.



MACHINE and TOOL BLUE BOOK

Self-adjusting Live Center

A one-piece main body serves as a cup for the roller bearing, which per-



mits use of a greater than normal capacity bearing. Automatic wear adjustment takes place as tapered roller bearing moves back when wear occurs. The live center has concentricity of less than .0001" t.i.r.

J & S Tool Co., Inc., 882 Dorsa Ave., Livingston, N.J.

Use postpaid card. Circle No. 640



"Did he say 'please' or am I imagining things?"

POWER SCRAPER Cuts Production Costs... 5 HOUR JOB CUT TO 50 MINUTES

One manufacturer was scraping flat pieces measuring 18 by 24 inches ... each piece requiring 5 hours to scrape by hand. An Anderson Power Scraper cut scraping time to 50 minutes! That meant a substantial saving in production costs and another happy Anderson customer. Let us help you estimate how much this portable, easy-to-use power scraper will save for you.



Today, Write for Bulletin 5-5

ANDERSON BROS. MFG. CO., Rockford, III.

NEW LOW COST LEAD SCREW TAPPER



Here is truly the most accurate, most precise, cost-cutting tapper! New, different, flexible, it can be operated with push button and foot control for cycle or jog, automatic or with switch in fixture for cycle and jog. Either way, it provides a uniformity, speed and precision accuracy that's unparalleled!

Fast, Economical, 6-way Operating

Action.

EASY TO OPERATE—PAYS FOR ITSELF!

Push button releases electrically controlled air pressure engaging sensitive friction clutch which actuates lead screw. The tap, completely controlled by lead screw, is fed gently, automatically without pressure. The result is repetitive uniformity and precision that never varies! Tests proved all tapped parts passed 100% inspection—without rejects!

Write for FREE Brochure for complete details!

PROCUNIER

SAFETY CHUCK COMPANY

14 South Clinton Street Dept. 5 Chicago, Illinois Use postpoid card. Circle No. 511

Hydraulic Press in 25, 50, 75, and 150 Ton Cap.

The line of air-operated hydraulic presses available claims to be excellent for bending, straightening, and other press work that must be completed in minimum time at reasonable price. The only requirement for operation is the



availability of compressed air. It is available in four tonnage capacities: 25, 50, 75, and 150.

One feature of special interest is the rapid ram approach which entirely eliminates the use of a hand wheel.

Dake Corp., Grand Haven, Mich.

Use postpaid card. Circle No. 634

Efficient M-3 High Speed Steel CLARK HOLE-PRODUCING TOOLS for production jobs on STANLESS & ALLOY STRELL CLARK HOLE MILL—Makes flowed diametes hoise featl One paon in thick steels. Easy of olines others speeds. CLARK ADJUSTABLE SPOT-PACER AND COUNTERBORE—One tool makes meany diameters. Easily reground and reset. Heavy outs in mills, drills, redials, turreta. 1" to 4" atoms; others speelds.

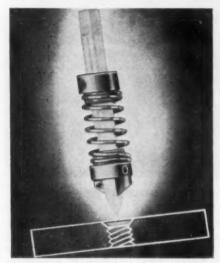
Write for Information on all Clark HOLE-PRODUCING TOOLS!

Use postpaid card. Circle No. 512

MACHINE and TOOL BLUE BOOK

Deburring Tool for Taps

The device taps and de-burrs in one operation by slipping the Burr-Bit over



a two or four fluted heli-coil tap. While tap is being withdrawn from workpiece, the tool starts to operate, leaving the top of the hole smooth and clean for easy heli-coil insertion.

Burr-Bits come in sizes No. 4 to %".
Vernon Devices, Inc., Mt. Vernon,
N.Y.

Use postpaid card. Circle No. 644

Wheel Dresser Dresses to Tenths

Designed for use with cylindrical grinders, the Model 89 hydraulic contour wheel dresser will dress any angle on the wheel perpendicular as well as horizontal. If necessary, it can undercut grinding wheels and can dress at uniform peripheral speed. The machine offers automatic, hydraulic operation, with dressing accuracies within a tenth claimed.

The model is available with precision computed templates for profile



this sturdy simple tool can be used on any type arbor press for continuous efficient keyways — in any quantity

COSTS OFTEN REDUCED
AS MUCH AS 10 TIMES

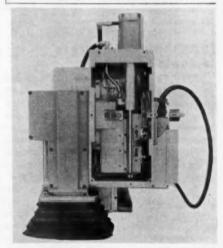
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DEALER INQUIRIES INVITED The Baj Tool Co.

Formerly seld by
East Shore Mathine Co.

19751 St. Clair Avenue
Cleveland 19, Ohio

Use postpaid card. Circle No. 513



widths up to 6" and profile depths up to 31/2".

Hoglund Engineering & Mfg. Co., Inc., 340 Snyder Ave., Berkeley Hts., N.J.

BOOKS AND FILMS

Cut-Off Band Saw

Featured in a recent film available from the DoAll Company is the 24" capacity, heavy-duty Model 24 power saw. Entitled "A Production Cut-Off Band Saw," it shows how cost-cutting methods are applied to basic cut-off operations by using the 2" wide high-speed steel saw band to cut large billets, rails, bars, and structurals.

The machine is shown cutting various alloys. Shown, too, are the simplified controls and their functions for smooth operation.

In 16 mm. sound and color, running time is approximately 10 minutes. It is available on free loan.



This Guide lists more than 10,000 manufacturers who distribute their products through agents. The directory is classified by industry and provides a comprehensive listing of manufacturers and their addresses. It includes information on their principal products, estimated credit rating, and the name and title of the sales executive.

As an additional aid to agents, the Guide details steps to follow in communicating with manufacturers, suggests commission scales for various products, typical clauses to consider in a manufacturer-manufacturers' agent contract, and provides data on operations as an agent. 150 pp. Price \$10.

Manufacturers' Agent Publishing Co., 505 Fifth Ave., New York 17.



Importance of Bending

"It's Easy to Bend" is a 17-minute, 16 mm color-sound movie describing bending as a basic metalworking process, why it is important, where it has made contributions, and how it is done.

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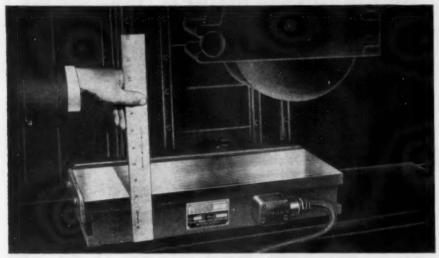
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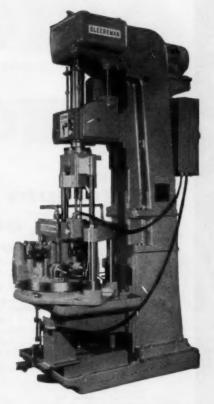
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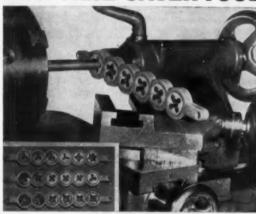
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| 4 4 4 4 4 4 | 7/32 9/32 5/16 7/16 9/16 11/16 13/16 | | 12.55 14.70 15.05 16.55 18.90 19.90 22.95 25.25 26.00 |
| 4 | 1 - 1/8 1 - 1/4 1/4 5/16 3/8 7/16 | - 1/4 | 28.35 31.20 19.25 19.60 21.65 23.05 |
| 455555555566 | 9/16 11/16 13/16 7/8 15/16 | 1 - 1/4 | 25.90 28.95 31.20 33.55 34.65 23.75 24.30 |
| 6 6 6 6 | 5/16 3/8 7/16 9/16 11/16 13/16 | 1 - 1/4 - 1/4 | 26.05 27.85 34.30 36.80 39.35 40.30 |
| 8 8 8 | 15/16 1/4 5/16 3/8 7/16 | 1 - 1/4 | 42.35 52.45 54.65 56.15 59.05 |
| 8 8 | 1/2 9/16 5/8 11/16 | 1 - 1/4 1 - 1/4 1 - 1/4 | 60.00 62.30 63.25 65.30 |
| 8 8 10 | 13/16 7/8 15/16 1/4 5/16 | 1 - 1/4 1 - 1/4 1 - 1/4 1 - 1/2 | 66.55 68.40 70.25 96.65 97.80 |
| 10 10 10 | 3/8 1/2 5/8 3/4 | 1 - 1/2 1 - 1/2 1 - 1/2 1 - 1/2 | 92.15 101.53 115.90 |
| 10 10 12 12 | 7/8 1 1/2 5/8 | 1 - 1/2 1 - 1/2 1 - 1/2 1 - 1/2 | 145.13 150.33 169.33 |
| 12 12 12 | 3/4 7/8 | 1 - 1/2 | 191.80 242.10 260.21 |

| DIAM- ETER | WIDTH OF FACE | SIZE OF HOLE | PRICE |
|-----------------|------------------|--|--------|
| 5 | 1/4 | 1 - 1/4 | 23.05 |
| 5 | 5/16 | 1 - 1/4 | 24.05 |
| 555666666888888 | 3/8 | 1 - 1/4 | 25.50 |
| 6 | 5/16 | - 1/4 - 1/4 - 1/4 - 1/4 | 33.90 |
| 6 | 7/16 | 1 - 1/4 | 35.05 |
| 6 | 9/16 | 1 - 1/4 | 40.35 |
| 6 | 11/16 | 1 - 1/4 | 44.05 |
| 6 | 13/16 | 1 - 1/4 | 46.35 |
| 6 | 15/16 | 1 - 1/4 | 49.00 |
| 8 | 5/16 | 1 - 1/4 | 69.50 |
| 8 | 7/16 | 1 - 1/4 | 73.50 |
| 8 | 9/16 | 1 - 1/4 | 77.60 |
| 8 | 11/16 | 1 - 1/2 | 83.20 |
| 8 | 13/16 | 1 - 1/2 | 87.30 |
| 8 | 7/8 | 1 - 1/2 | 91.60 |
| 8 | 1 | 1 - 1/2 | 96.10 |
| 10 | 1/4 | 1 - 1/2 | 96.60 |
| 10 | 5/16 | 1 - 1/2 | 98.00 |
| 10 | 3/8 | 1 - 1/2 | 99.15 |
| 10 | 7/16 | 1 - 1/2 | 105.25 |
| 10 | 1/2 | 1 - 1/2 | 109.75 |
| 10 | 9/16 | 1 - 1/2 | 121.95 |
| 01 | 5/8 | 1 - 1/2 | 124.40 |
| 10 | 3/4 | 1 - 1/2 | 142.30 |
| 10 | 7/8 | 1 - 1/2 | 146.65 |
| 10 | 1 | 1 - 1/2 | 153.10 |
| 12 | 1/2 | 1 - 1/2 | 176.50 |
| 12 | 5/8 | 1 - 1/2 | 188.05 |
| 12 | 3/4 | - 1/2 | 199.60 |
| 12 | 7/8 | - /4 - /4 - /4 - /4 - /4 - /2 - /2 | 243.80 |
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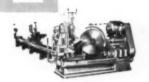
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